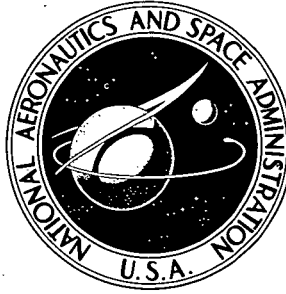


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**PRESSURE DISTRIBUTIONS FOR
A RECTANGULAR SUPERSONIC INLET
AT SUBSONIC SPEEDS**

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PRESSURE DISTRIBUTIONS FOR A RECTANGULAR SUPERSONIC INLET AT SUBSONIC SPEEDS

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SUMMARY

An investigation has been conducted to provide pressure distribution data for a supersonic rectangular inlet at subsonic speeds. Variations in cowl and ramp geometry as well as sideplate sweep were investigated. Tests were made in the Langley 16-foot transonic tunnel and the Langley high-speed 7- by 10-foot tunnel for Mach numbers of 0.6, 0.7, and 0.8. Angles of attack investigated were 0° , 4° , and 8° for a range of mass-flow ratios.

INTRODUCTION

Inlets designed for supersonic aircraft are required to operate at off-design speeds for some portion of their flight time. The amount of off-design flight will depend on the specific aircraft and mission. Operation of a supersonic inlet at lower than design speeds results in a requirement for disposal of excess capture air.

While numerous bypass, bleed, and/or deflection methods exist for disposal of excess capture air, they generally involve some degree of trade-off with regard to weight penalty and mechanical complexity. An alternate method of disposing of excess capture air is by spillage over the cowl which generally results in a spillage drag penalty.

Considerable work has been published concerning the assessment of spillage drag for supersonic inlets at off-design Mach numbers. (See refs. 1 to 5, for example.) Examination of the available data, however, indicates a lack of the definitive pressure data desirable for development of the spillage drag prediction techniques required for supersonic inlet trade studies. The current program was initiated to provide definitive pressure data for a supersonic rectangular inlet with parametric variations in cowl shape and ramp angle. The instrumentation was designed to allow accurate assessment of the two components of spillage drag: (1) additive drag (sum of the forces in the thrust direction on the entering streamline), and (2) cowl drag.

Tests were run at Mach numbers of 0.6, 0.7, and 0.8 for angles of attack of 0° , 4° , and 8° . Configuration variables included cowl shape, ramp angle, and sideplate sweep. Mass-flow ratios were varied from about 0.3 to 0.8 depending on the test Mach number.

SYMBOLS

A	area
A_c	capture area, $\alpha = 0^\circ$; projected height from ramp leading edge to the forward point on cowl times width of inlet
A_{ref}	reference area, 0.028578 m^2 ; projected height from ramp leading edge to station 91.44 on cowl times width of inlet
A_∞	free-stream tube area of captured flow
$C_{D,add}$	$= \frac{\text{Additive drag}}{qA_{ref}}$
$C_{D,cowl}$	$= \frac{\text{Cowl external drag}}{qA_{ref}}$
$C_{D,ramp}$	$= \frac{\text{Ramp drag}}{qA_{ref}}$
$C_{D,spill}$	$= C_{D,add} + C_{D,cowl}$
C_p	(C_p on computer plots) pressure coefficient, $\frac{p - p_\infty}{q}$
J	momentum
L_1	characteristic ramp length, cm
L_2	characteristic sideplate length, cm
L_3	characteristic cowl length, cm
M	Mach number
p	local static pressure

p_{∞}	free-stream static pressure
q	dynamic pressure
x	(X on computer plots) length, cm
z	height, cm
α	angle of attack, deg
β	cowl orifice placement angle, deg (see fig. 1(d))
δ_1, δ_2	ramp angles, deg (see fig. 1(a))

Subscripts:

∞	free stream
1	condition at inlet rake

Abbreviations:

MFR	mass-flow ratio
SYM	symbol

APPARATUS AND TESTS

Model Description

The model is representative of a two-dimensional supersonic ramp inlet. (See fig. 1.) Provisions were made for interchangeable ramp configurations: a ramp with $\delta_1 = \delta_2 = 5^\circ$ and a ramp with $\delta_1 = 5^\circ$ and $\delta_2 = 10^\circ$. Two sideplate configurations were utilized. The majority of the data were taken utilizing rectangular "slab" sideplates which extended below and well aft of the cowl lip. It was intended that these sideplates would provide near two-dimensional flow for the inlet. For the second sideplate configuration, the leading edge was swept from the ramp leading edge to the cowl lip leading edge.

The seven cowl shapes were of elliptical external shape. Variations were made in the leading-edge geometry with resultant variations in the elliptical coordinates. The cowl numbers are keyed to the leading-edge geometry. The last digit of the cowl number

indicates the leading-edge radius (i.e., 0 = No radius; 1 = 0.127-cm radius; 2 = 0.254-cm radius; 3 = 0.508-cm radius). The first two digits of the cowl number indicate the angle (with respect to the horizontal reference) at which the elliptical shape passes through the cowl reference point, or becomes tangent to the leading-edge radius.

Figure 1(c) presents the cowl geometries in schematic form and the major and minor axes for the elliptical geometry. The reference point for each cowl was at station $x = 40.005$ cm and $z = -14.559$ cm with respect to the ramp leading edge. The initial internal line of the cowls was at 6° to the horizontal reference plane. The elliptical minor axis was located at station $x = 90.805$ cm and $z = -20.001$ cm.

Mass flow for the inlet was varied by an aft-mounted remotely variable plug.

Photographs of the model are shown in figure 2.

Instrumentation

Instrumentation consisted of up to 260 pressure orifices which were distributed about the ramp, left sidewall, cowl, inlet rake, and the engine face rake. Pressures were measured by six 48-port electrically actuated pressure scanning valves which were mounted in the model sting.

In order to adequately define the cowl stagnation points, the 0.0381-cm internal diameter orifices were placed on 0.0381-cm centers. To alleviate physical interference these orifices were spaced laterally over 2.54 cm.

Tests

Tests were run in the Langley high-speed 7- by 10-foot tunnel and in the Langley 16-foot transonic tunnel, both of which are atmospheric return facilities. Tests were made at Mach numbers of 0.6, 0.7, and 0.8 and at angles of attack of 0° , 4° , and 8° .

CALCULATION PROCEDURE

Figure 3 illustrates an inlet schematic with notation to support the following description.

Conservation of momentum in the x-direction indicates that

$$J_\infty - J_1 = \underbrace{\int_1^2 (p - p_\infty) dA}_{\text{Ramp force}} + \underbrace{\int_2^3 (p - p_\infty) dA}_{\text{Rake plane force}} + \underbrace{\int_3^4 (p - p_\infty) dA}_{\text{Internal cowl force}} + \int_4^5 (p - p_\infty) dA$$

where dA is the projected area. The internal force on the bounding stream is then

$$\int_4^5 (p - p_\infty) dA = J_\infty - J_1 - \left[\int_1^2 (p - p_\infty) dA + \int_2^3 (p - p_\infty) + \int_3^4 (p - p_\infty) dA \right]$$

Additive drag is defined as the force acting on the streamline bounding the entering flow, from free-stream conditions to the cowl stagnation point. Thus,

$$\text{Additive drag} = - \int_4^5 (p - p_\infty) dA$$

Station 4 represents the stream stagnation point for a given cowl configuration. The stagnation points were located experimentally except for the sharp cowls where the stagnation point was assumed fixed at the leading edge. (See the basic data figures.) Applicable ramp and cowl local pressures were applied to local area segments to determine ramp and internal cowl drag increments. (See fig. 1 for orifice coordinates.)

For the calculation of the momentum J_1 at the rake plane, area segments were assigned each total pressure orifice on a geometric basis. The static pressure orifices (see fig. 1(h)) were averaged for each horizontal row and a linear variation was assumed vertically for intermediate values. From the linear variation, a static pressure was selected for the total pressure orifices at a given height. Pressure forces in the rake plane $\int_2^3 (p - p_\infty) dA$ were calculated using the static pressure values previously assigned with the total pressure orifices. The engine face rake was used to verify that correct calculation procedures were used for the throat rake (i.e., values of mass-flow ratio were compared for the two rakes; agreement was within ± 1 percent.)

All calculations were carried through appropriate steps to account for correction values for angle of attack, and rake and surface misalignment with the free-stream flow. The cowl external drag (or thrust) was calculated by integrating local pressures from the stream stagnation point to the point where the cowl surface becomes tangent to the model reference line. (For $\alpha = 0^\circ$, the model reference line is coincident with the free stream.)

Thus, Cowl drag $= \int_4^6 (p - p_\infty) dA$. Spillage drag is defined as the additive drag plus the cowl (external) drag. It should be noted that the cowl drag calculation represents only the pressure drag (no skin friction).

PRESENTATION OF DATA

The data obtained in this investigation are presented in the following figures:

	Figure
Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = \delta_2 = 5^\circ$	4
Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	5
Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = \delta_2 = 5^\circ$; swept sideplate	6
Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$; swept sideplate	7
Additive and cowl drag characteristics. Cowl 90-2; $\delta_1 = \delta_2 = 5^\circ$	8
Additive and cowl drag characteristics. Cowl 90-2; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	9
Additive and cowl drag characteristics. Cowl 90-3; $\delta_1 = \delta_2 = 5^\circ$	10
Additive and cowl drag characteristics. Cowl 90-3; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	11
Additive and cowl drag characteristics. Cowl 20-0; $\delta_1 = \delta_2 = 5^\circ$	12
Additive and cowl drag characteristics. Cowl 20-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	13
Additive and cowl drag characteristics. Cowl 45-0; $\delta_1 = \delta_2 = 5^\circ$	14
Additive and cowl drag characteristics. Cowl 45-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	15
Additive and cowl drag characteristics. Cowl 20-2; $\delta_1 = \delta_2 = 5^\circ$	16
Additive and cowl drag characteristics. Cowl 35-2; $\delta_1 = \delta_2 = 5^\circ$	17
Ramp drag characteristics. Cows 90-1, -2, -3, 90-1 with swept sideplate; $\delta_1 = \delta_2 = 5^\circ$	18
Ramp drag characteristics. Cows 90-1, -2, -3, 90-1 with swept sideplate; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	19
Ramp drag characteristics. Cows 90-1, 45-0, 20-0; $\delta_1 = \delta_2 = 5^\circ$	20
Ramp drag characteristics. Cows 90-1, 45-0, 20-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	21
Ramp drag characteristics. Cows 90-2, 35-2, 20-2; $\delta_1 = \delta_2 = 5^\circ$	22
Spillage drag characteristics	23
Pressure coefficients for cowl 90-1. $\delta_1 = \delta_2 = 5^\circ$	24
Pressure coefficients for cowl 90-1. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$	25
Pressure coefficients for cowl 90-1. $\delta_1 = \delta_2 = 5^\circ$; swept sideplate	26

	Figure
Pressure coefficients for cowl 90-1. $\delta_1 = 5^0$; $\delta_2 = 10^0$; swept sideplate	27
Pressure coefficients for cowl 90-2. $\delta_1 = \delta_2 = 5^0$	28
Pressure coefficients for cowl 90-2. $\delta_1 = 5^0$; $\delta_2 = 10^0$	29
Pressure coefficients for cowl 90-3. $\delta_1 = \delta_2 = 5^0$	30
Pressure coefficients for cowl 90-3. $\delta_1 = 5^0$; $\delta_2 = 10^0$	31
Pressure coefficients for cowl 20-0. $\delta_1 = \delta_2 = 5^0$	32
Pressure coefficients for cowl 20-0. $\delta_1 = 5^0$; $\delta_2 = 10^0$	33
Pressure coefficients for cowl 45-0. $\delta_1 = \delta_2 = 5^0$	34
Pressure coefficients for cowl 45-0. $\delta_1 = 5^0$; $\delta_2 = 10^0$	35
Pressure coefficients for cowl 20-2. $\delta_1 = \delta_2 = 5^0$	36
Pressure coefficients for cowl 35-2. $\delta_1 = \delta_2 = 5^0$	37

SUMMARY OF RESULTS

Pressure distribution data for the inlet configurations investigated are presented in figures 24 to 37. The additive and the cowl drag coefficients are presented in figures 4 to 17 with ramp drag coefficients presented in figures 18 to 22. The additive and cowl drag coefficients are combined to obtain spillage drag and are presented as figure 23.

Extended sideplates, which tend to provide near two-dimensional flow over the cowl and consequently afford a basis for relative comparison of cowls, were utilized for most of the investigation. However, it should be noted that resultant values of spillage drag are not necessarily representative of a more realistic, swept sideplate configuration. The effect of sweeping the sideplates can be seen in figures 23(a) and 23(b). The side spillage associated with the swept sideplates produces sizable increases in spillage drag. This increased spillage drag results primarily from decreased circulation over the cowl (with attendant loss in cowl thrust) as some of the capture air outflows over the side.

The effects of cowl leading-edge shape on spillage drag are seen in figure 23. Although the data are for mass-flow ratios down to about 0.3, meaningful flight values would generally be about 4.5.

Data for the series of cowls with a completely elliptical external shape (i.e., major axis passes through cowl leading edge) and a prime variable of leading-edge radius are presented in figures 23(a) and 23(b). The 90-2 (mid radius) cowl provides the lower spillage drag values for the $\delta_1 = \delta_2 = 5^0$ ramp configuration. For the $\delta_1 = 5^0$; $\delta_2 = 10^0$ ramp configuration, the differences between the three cowls (90-1, -2, -3) are less notable.

In figure 23(c), the 90-1 cowl (smallest radius and a fully elliptical shape) is compared with the sharp cowls (20-0, 45-0) for the $\delta_1 = \delta_2 = 5^\circ$ ramp configuration. The thicker sharp cowl (45-0) is superior, in terms of spillage drag, to the more traditional subsonic blunted cowl through most of the mass-flow range presented ($\alpha = 0^\circ$). Further, the sharpest cowl (20-0) is competitive with the blunted cowl through a large portion of the usable mass-flow range. The improvement of the sharp cowl with mass-flow ratio reflects the decreasing requirement to turn the spilled flow around the cowl (with the attendant separation) as the inlet swallows more of the capture flow. A sharp cowl shape therefore may be a viable configuration for a supersonic inlet that must operate in, or through, the subsonic Mach number range.

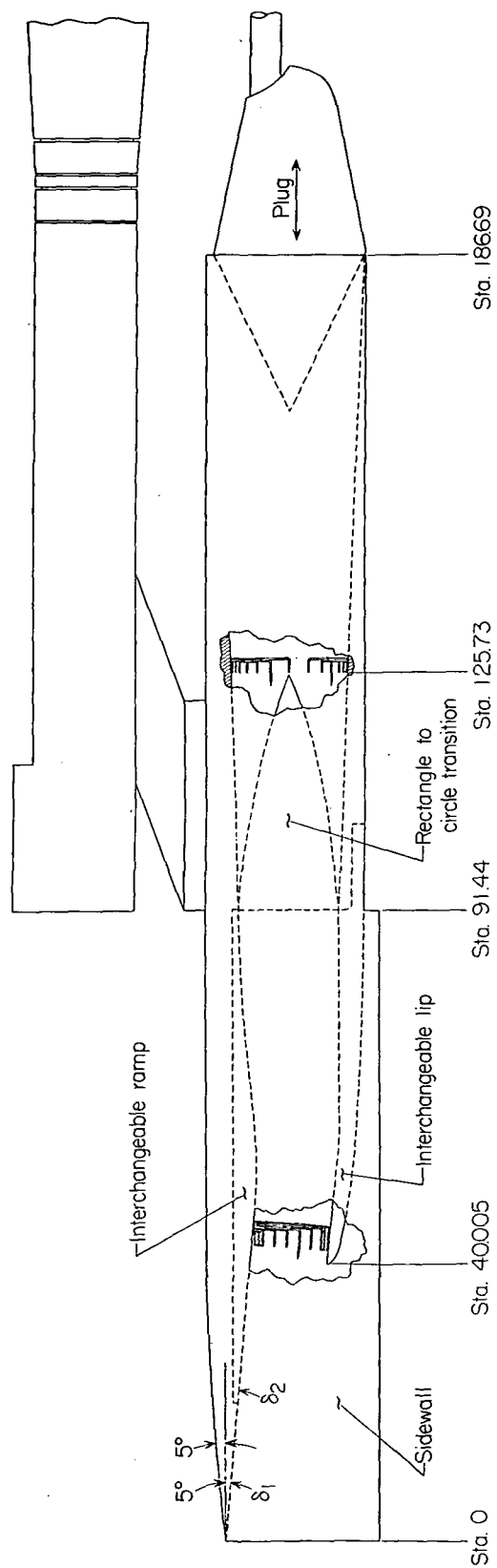
For the $\delta_1 = 5^\circ, \delta_2 = 10^\circ$ ramp configuration (fig. 23(d)), the effectiveness of the sharp cowls, with respect to the blunted cowl, is somewhat decreased.

Figure 23(e) illustrates the effect on spillage drag of varying the tangency point of the cowl external elliptic geometry and the cowl leading-edge radius. Allowing the tangency point to move outward (more spherical leading edge) results in increased spillage drag.

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Hampton, Va. 23665
October 9, 1975

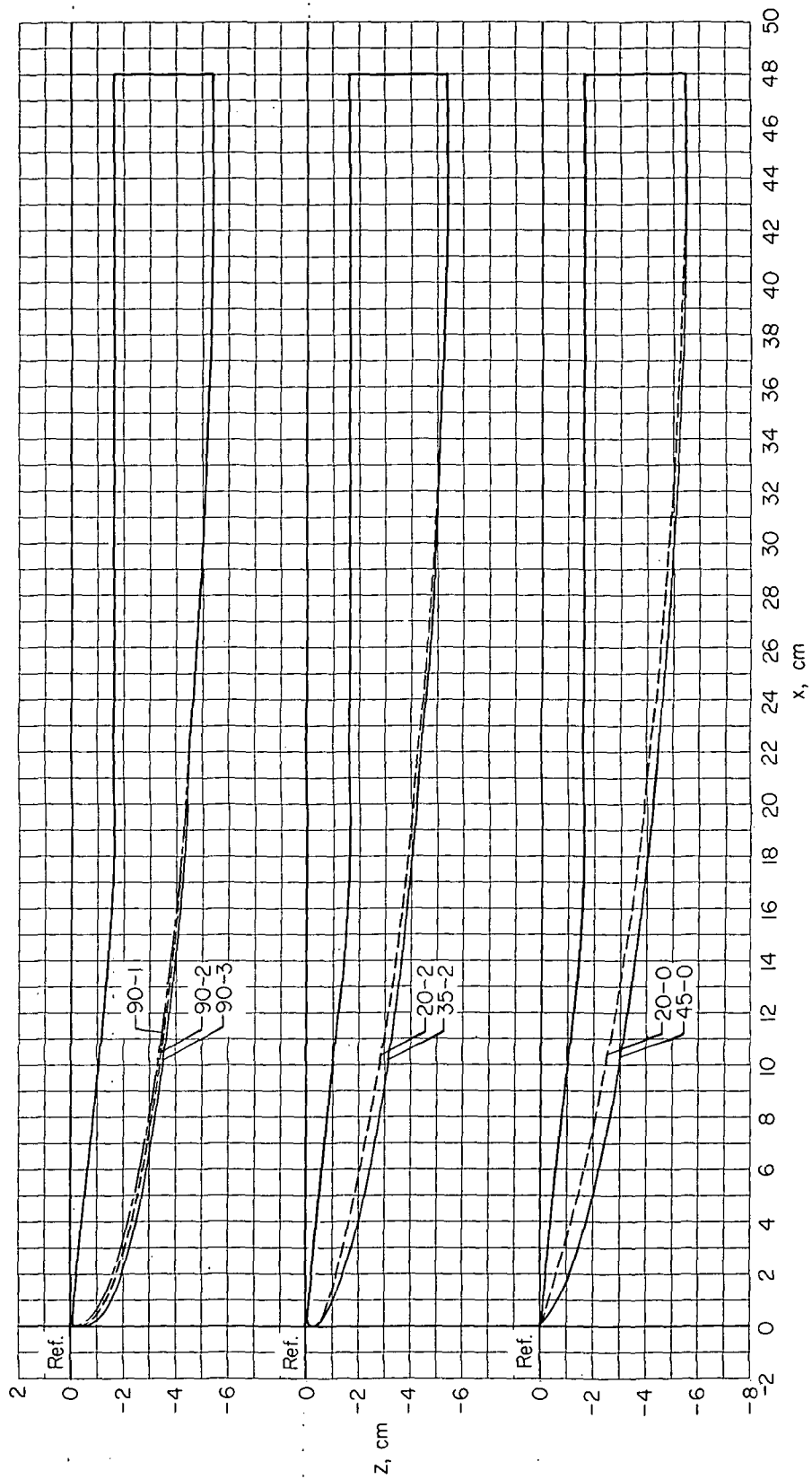
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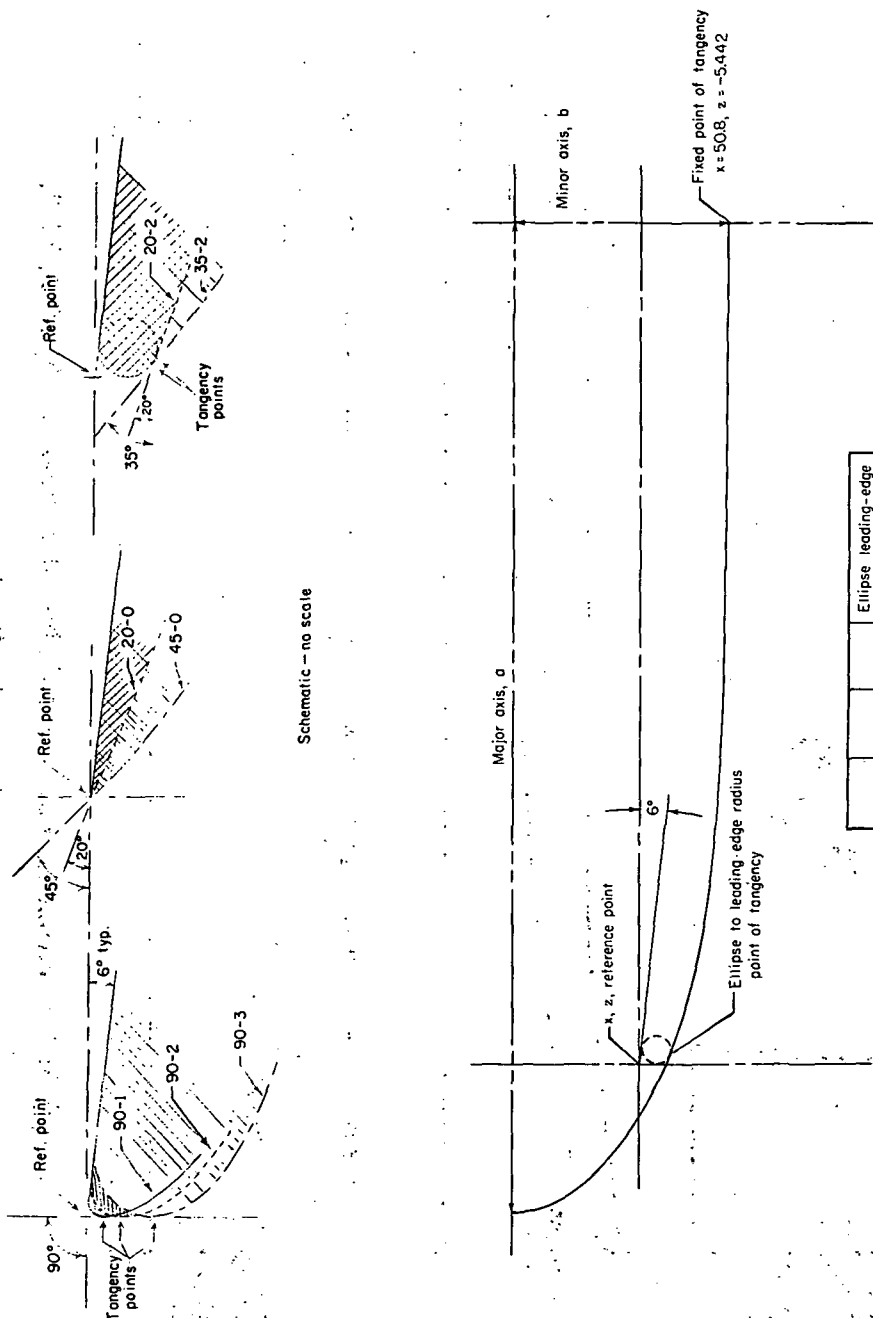
(a) Model details.

Figure 1.- Model assembly. (All linear dimensions are in centimeters.)



(b) Cowl lip shapes.

Figure 1.- Continued.



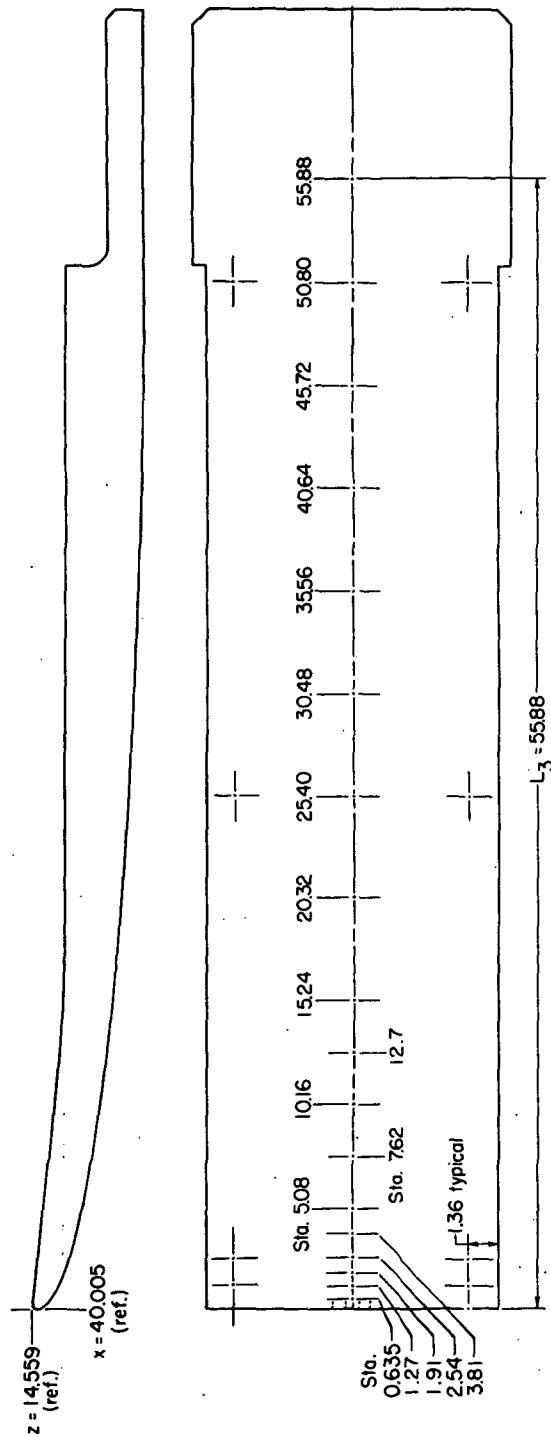
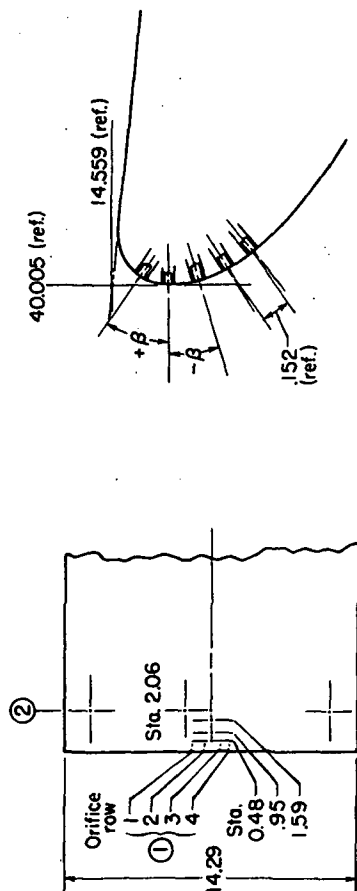
Cowl number	a	b	Ellipse leading-edge radius tangency point		
			x	z	
90-1	50800	5.306	0	-0.137	
90-2	50800	5.169	0	-0.272	
90-3	50800	4.897	0	-0.544	
20-0	55.893	9.337	0	0	
45-0	51.171	6.185	0	0	
20-2	54.427	7.793	.160	-0.505	
35-2	51.382	5.936	.104	-0.472	

(c) Cowl description.

Figure 1.- Continued.

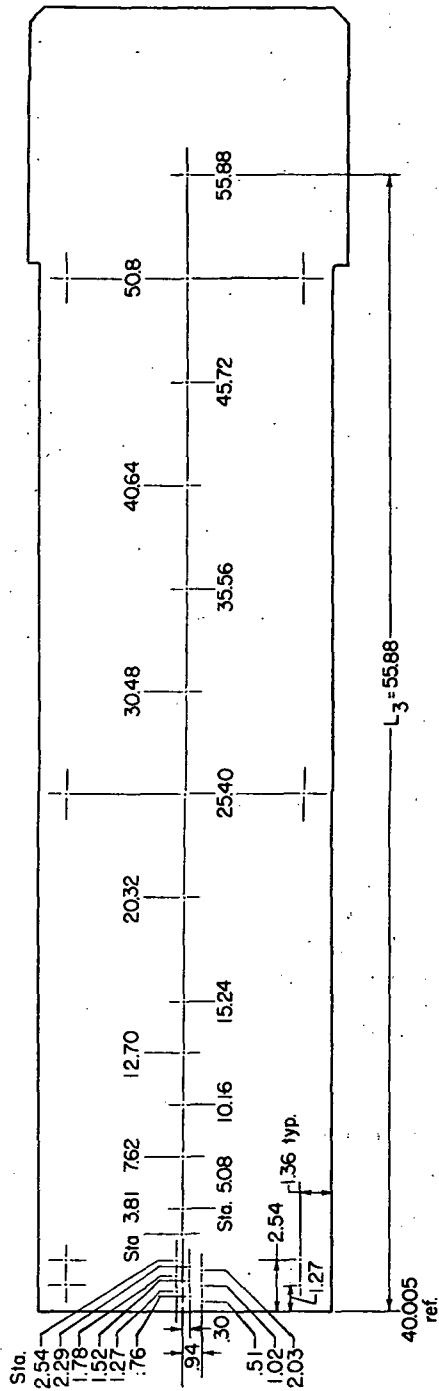
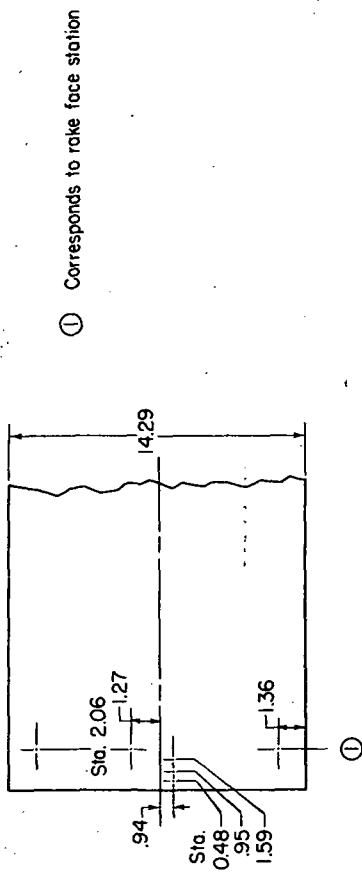
① In order to provide tube clearance, orifices about the forward portion of the blunted lips were staggered in four rows over a 2.54 span

② Corresponds to rake face station



(d) Orifice layout for blunted cowl lips 90-1, 90-2, 90-3, 20-2, 35-2.

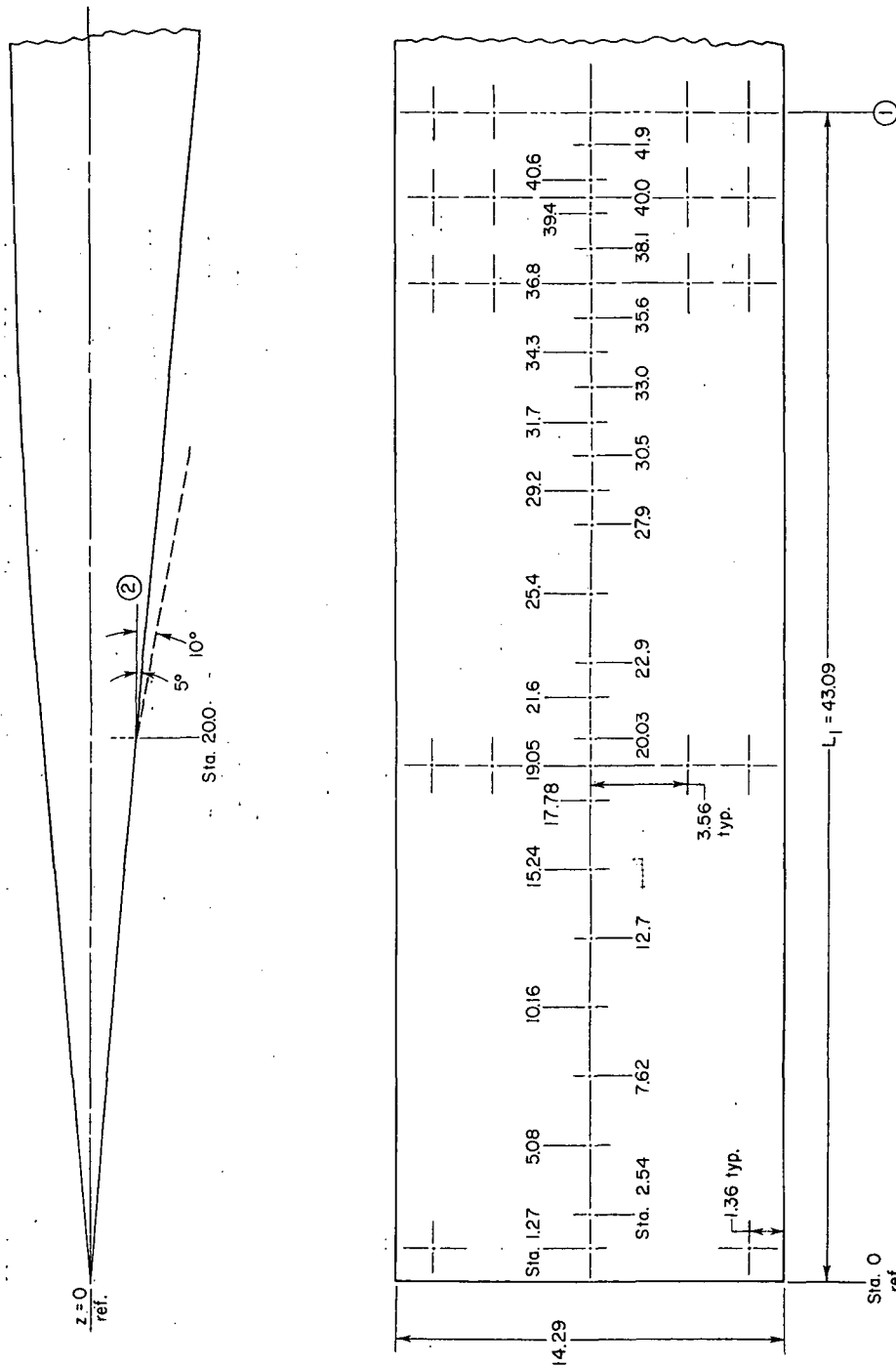
Figure 1.- Continued.



(e) Orifice layout for cowl lips 20-0, 45-0.

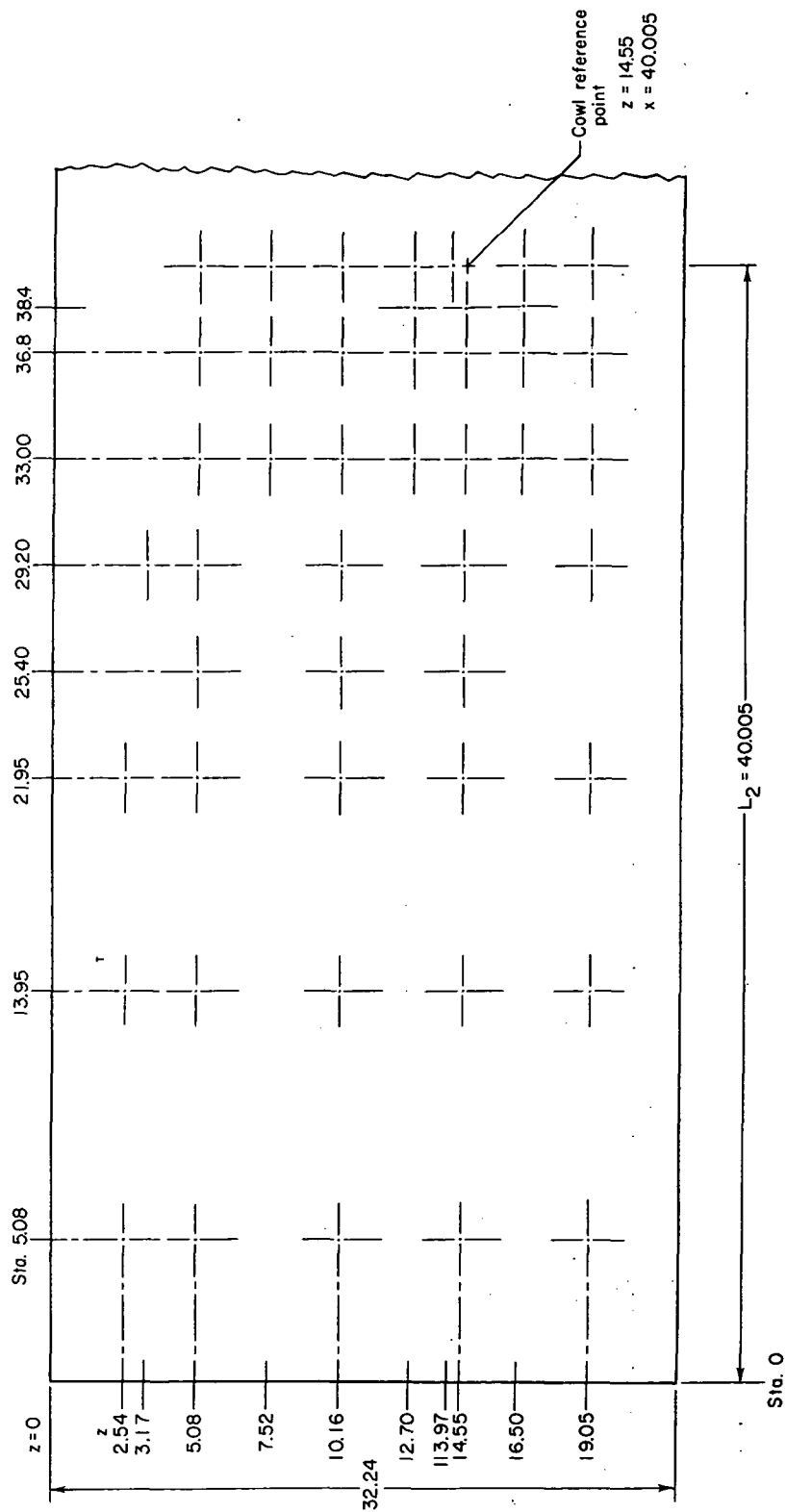
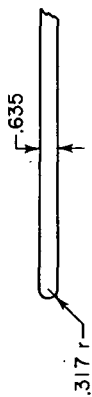
Figure 1. - Continued.

- ① The static orifices at sta. 43.09 correspond to the rake face station
- ② Orifice stations for the 10° ramp correspond to those for the 5° ramp



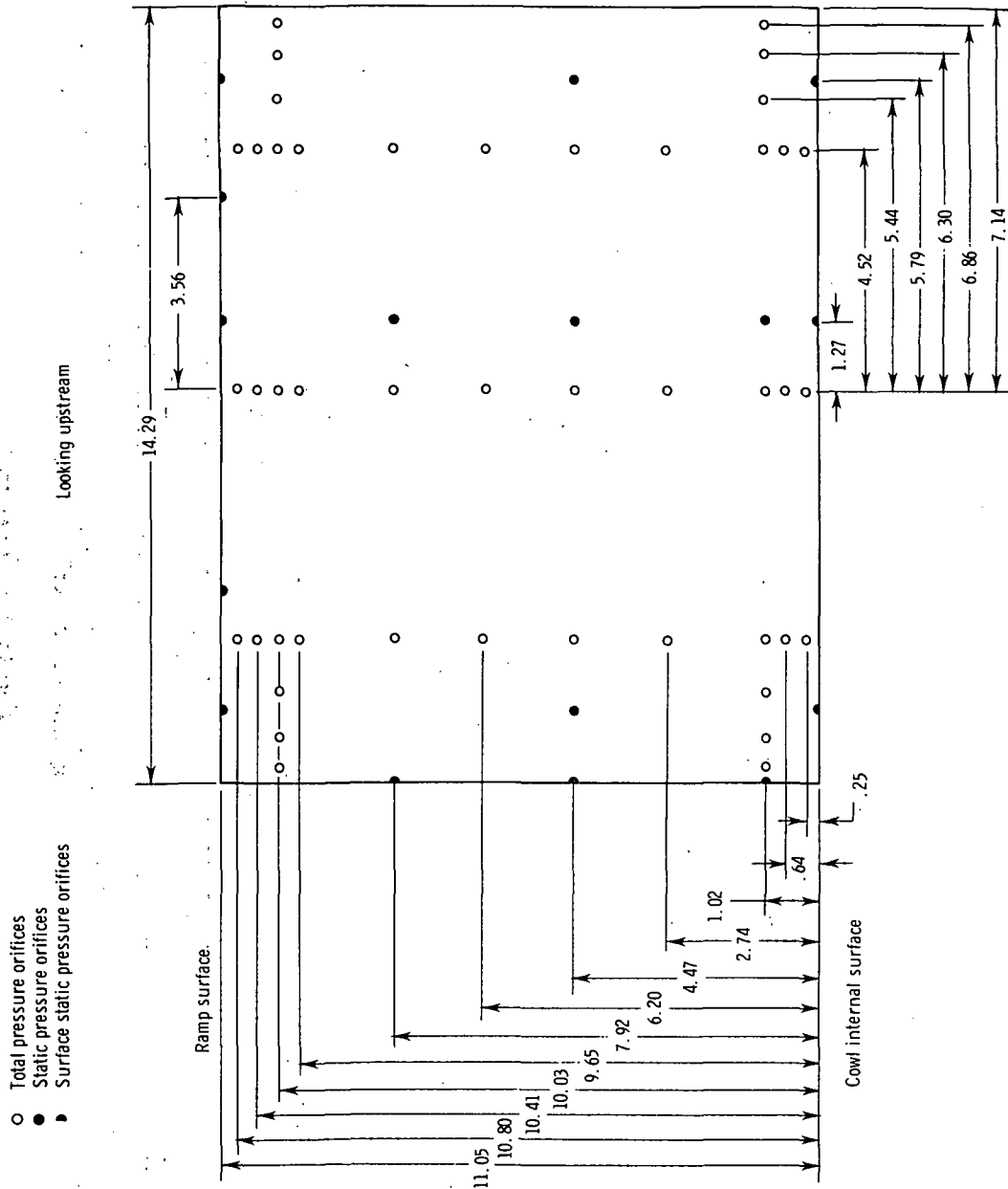
(f) Ramp orifice location.

Figure 1.- Continued.



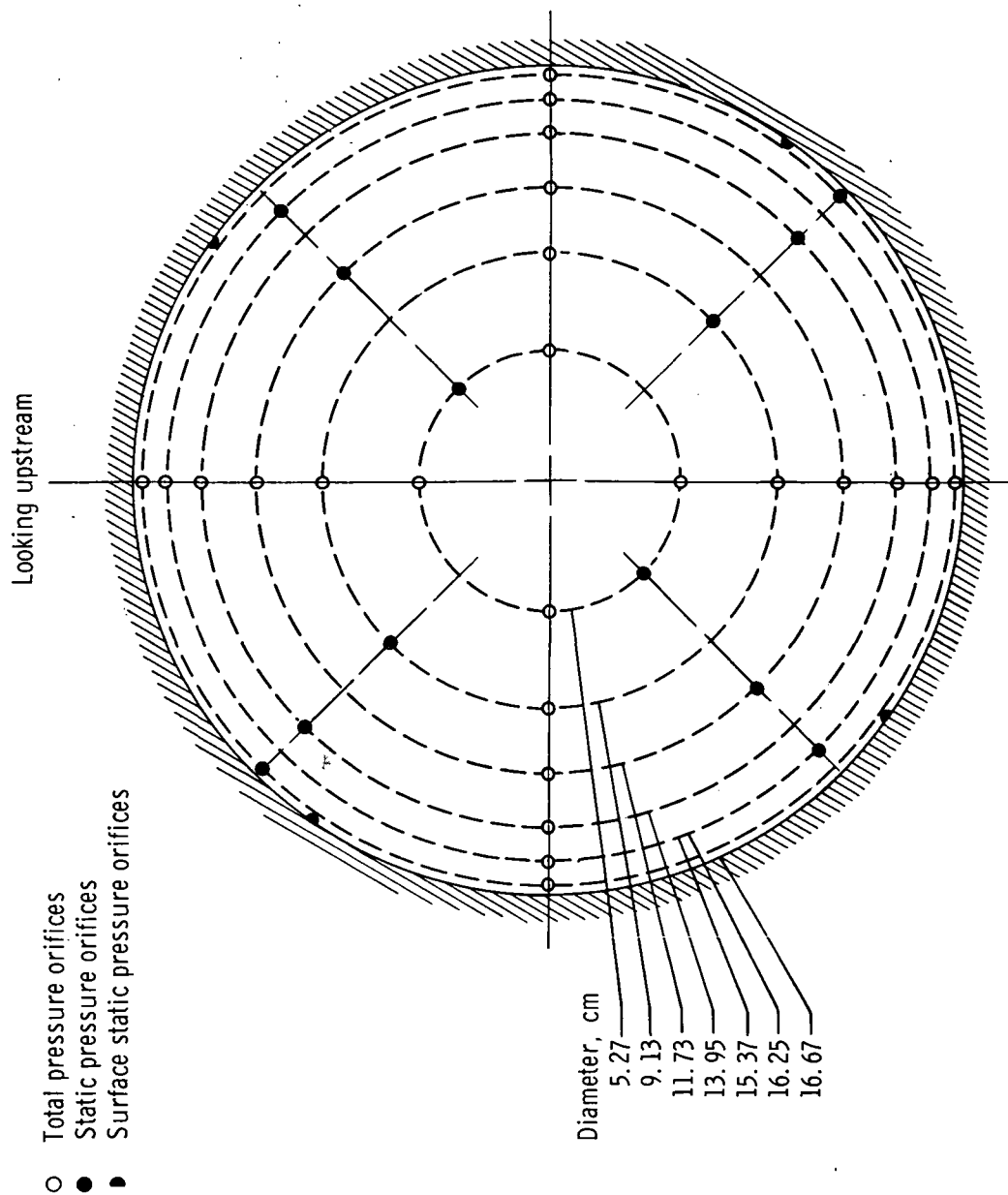
(g) Sideplate orifice locations.

Figure 1.- Continued.



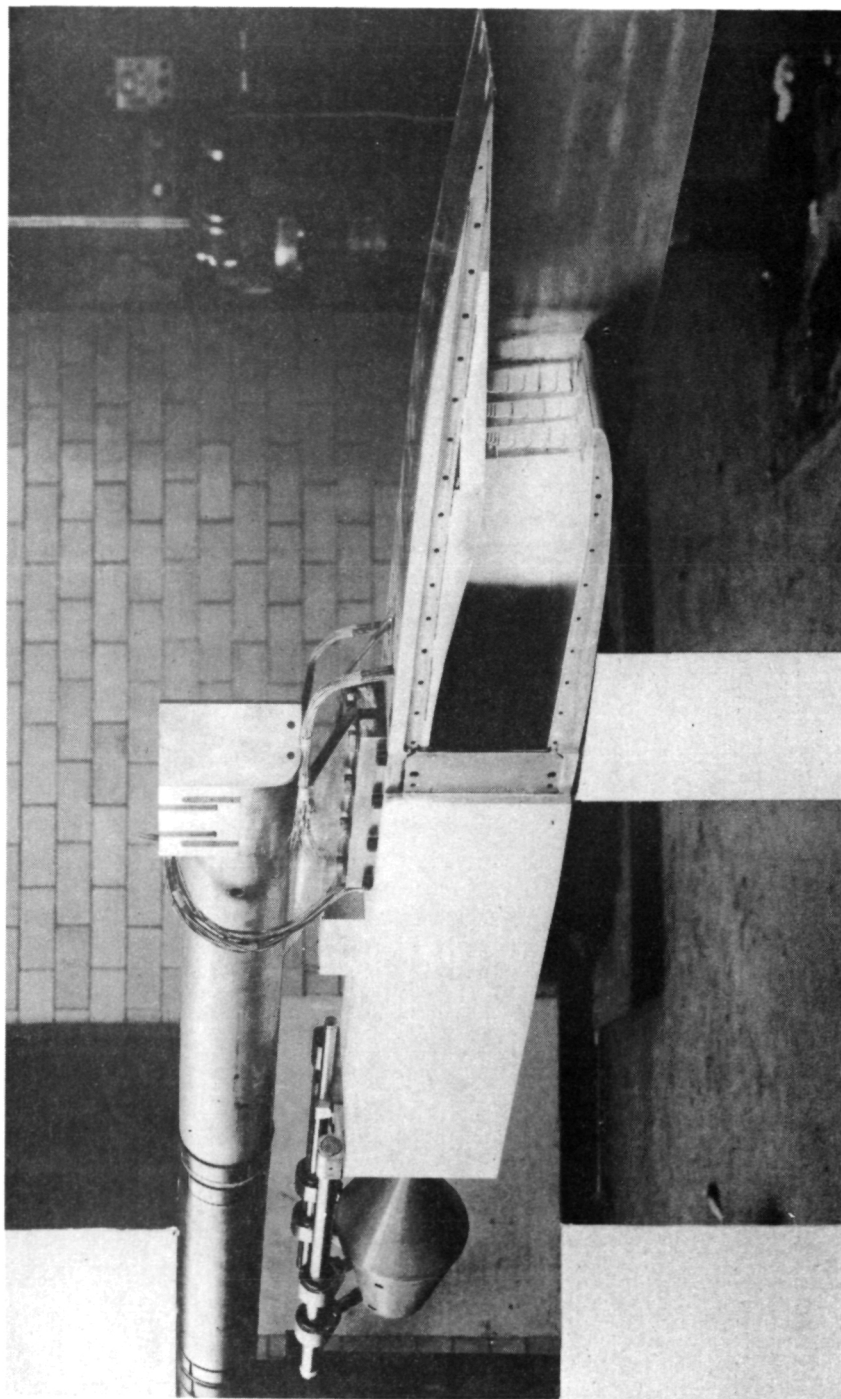
(h) Inlet orifice locations.

Figure 1.- Continued.



(i) Engine face orifice locations.

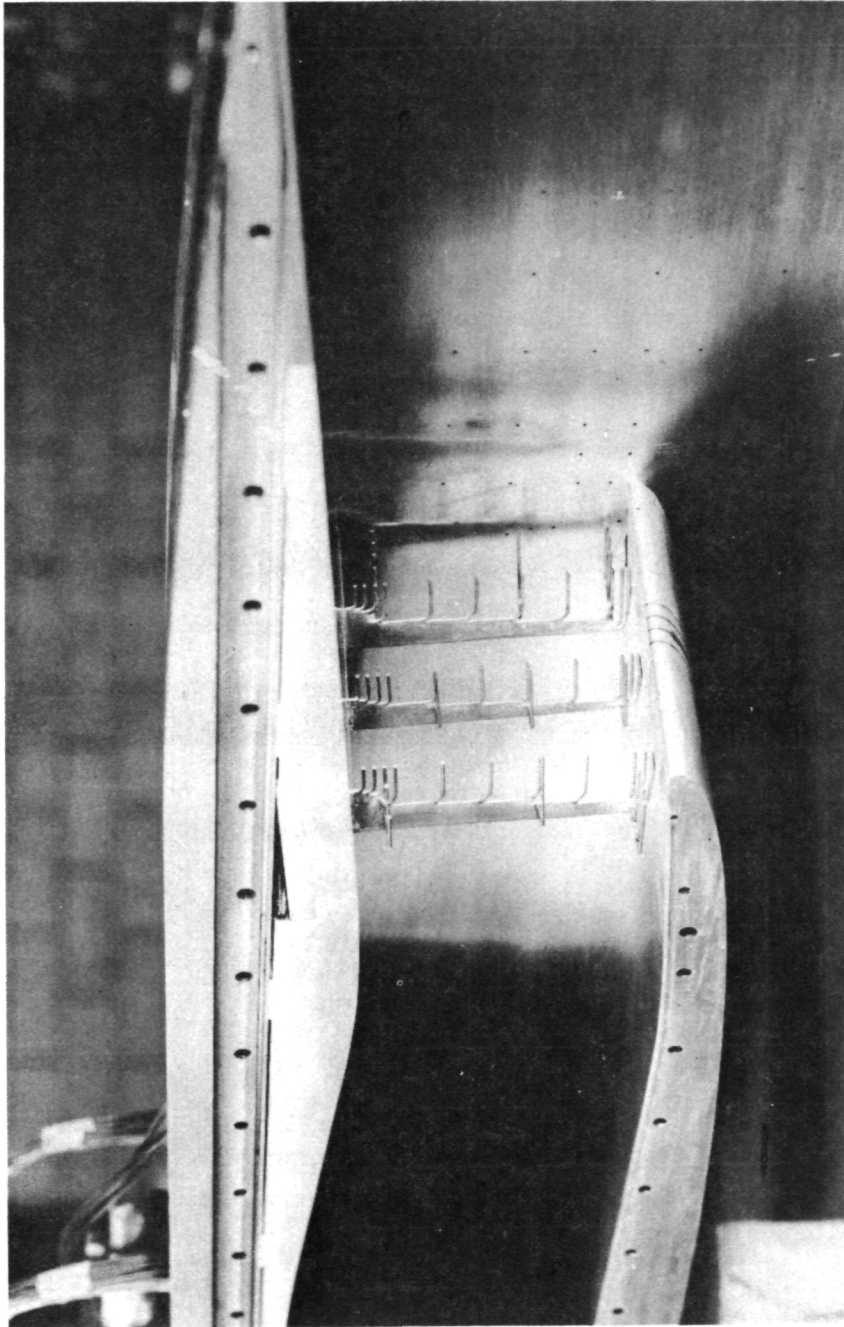
Figure 1.- Concluded.



L-72-3681

(a) Sideplate removed.

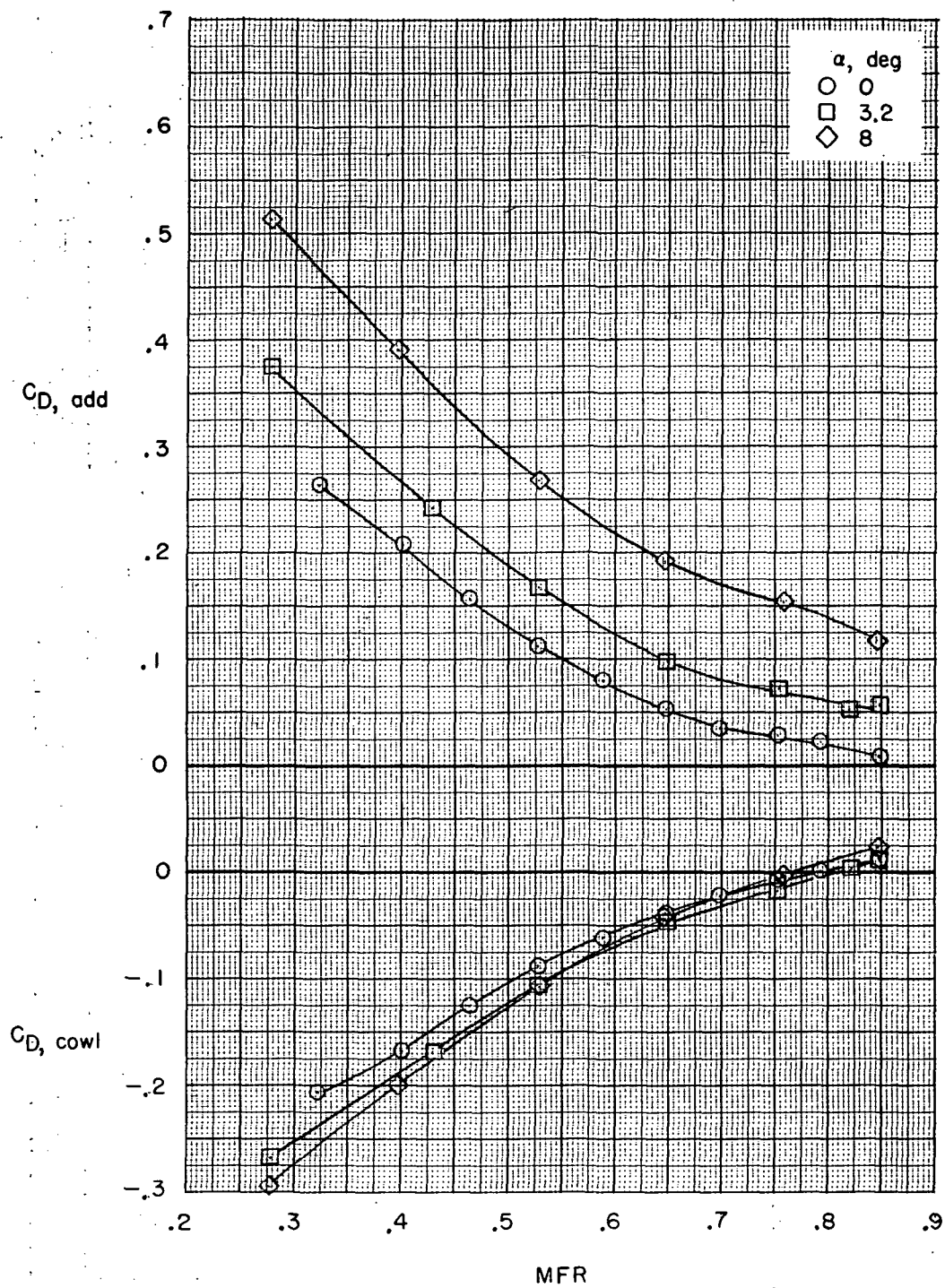
Figure 2.- Photograph of model.



L-72-3677

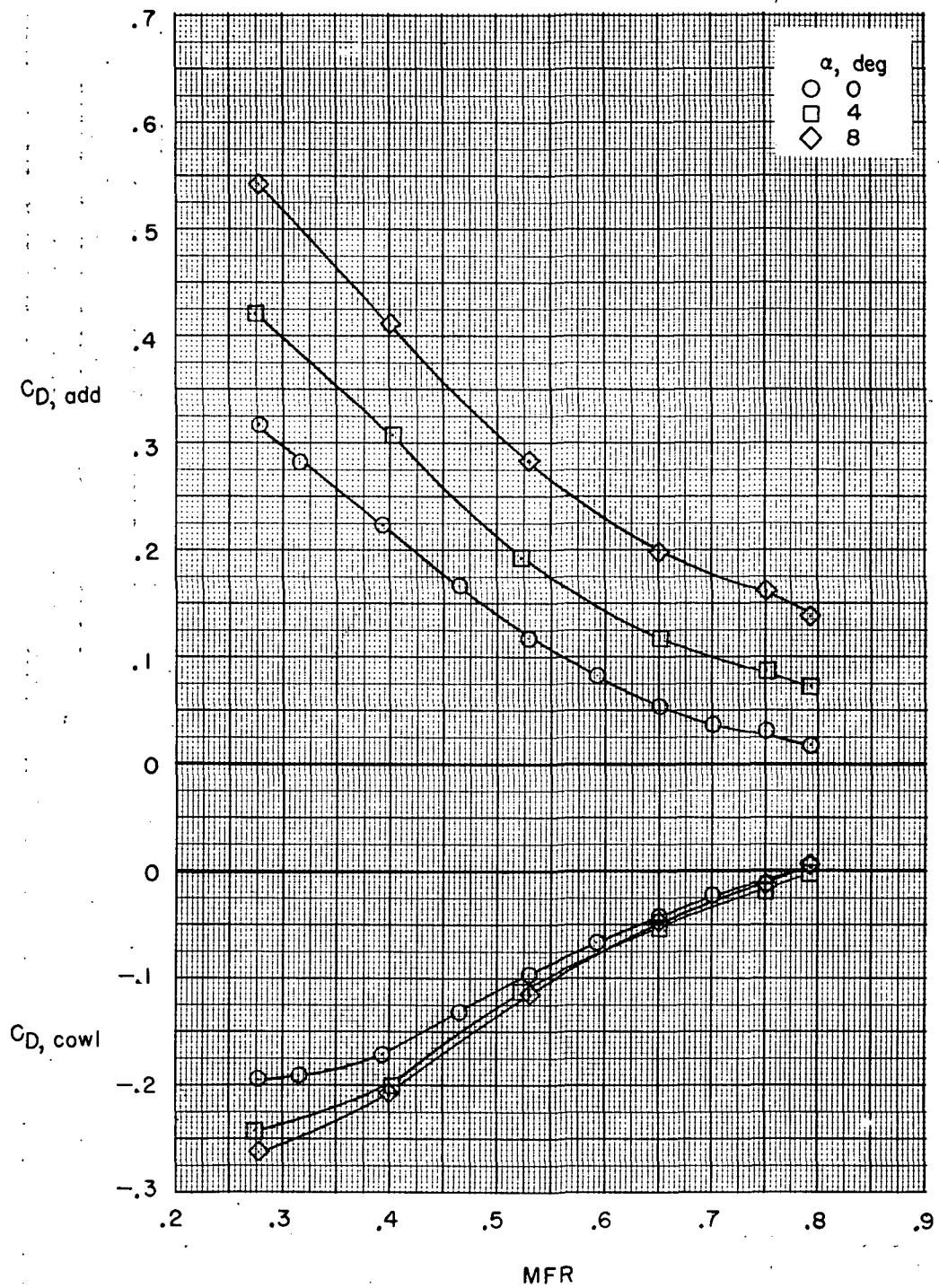
(b) Cowl lip and inlet rake details.

Figure 2.- Concluded.



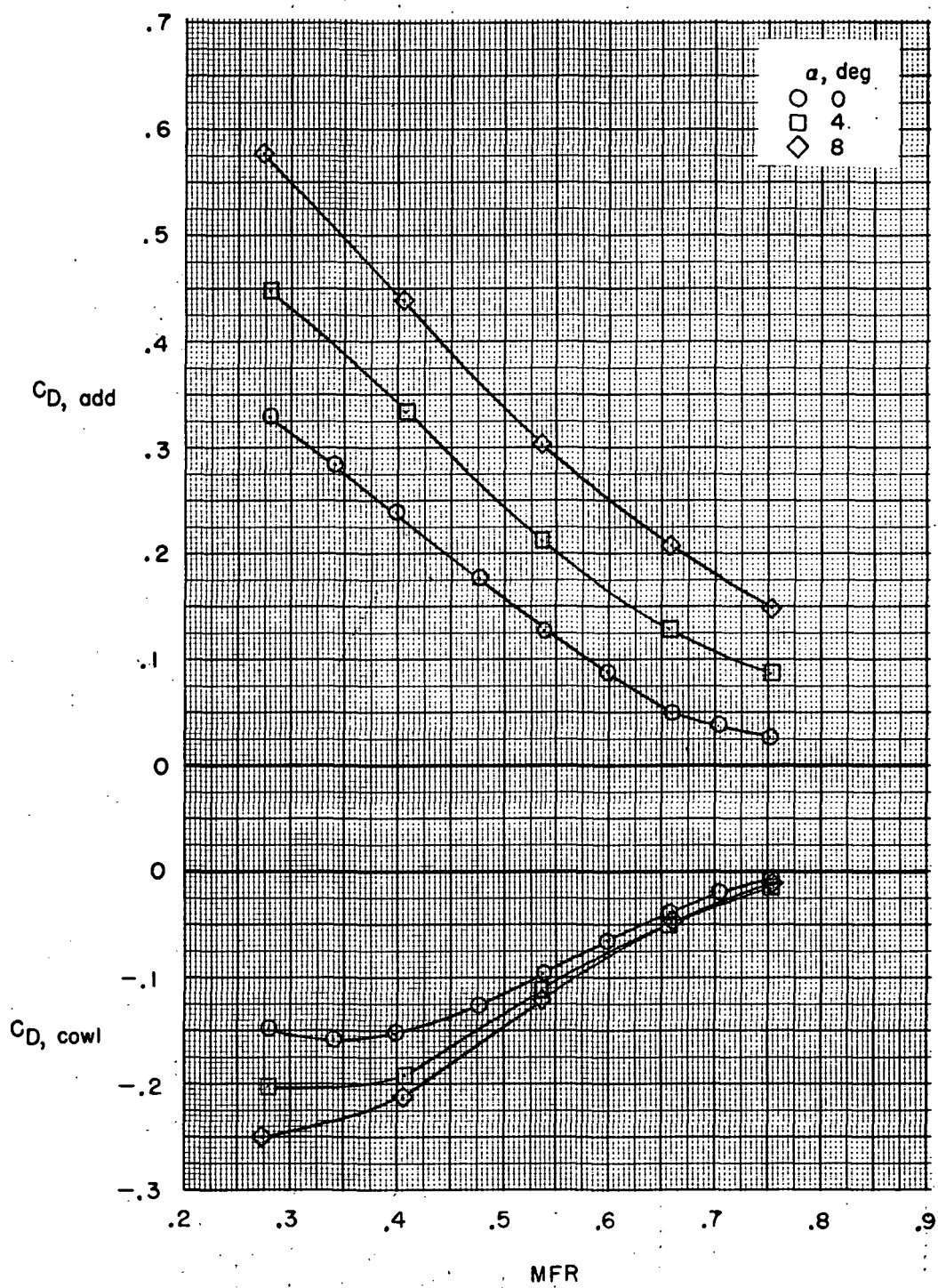
(a) $M = 0.6$.

Figure 4.- Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = \delta_2 = 5^\circ$.



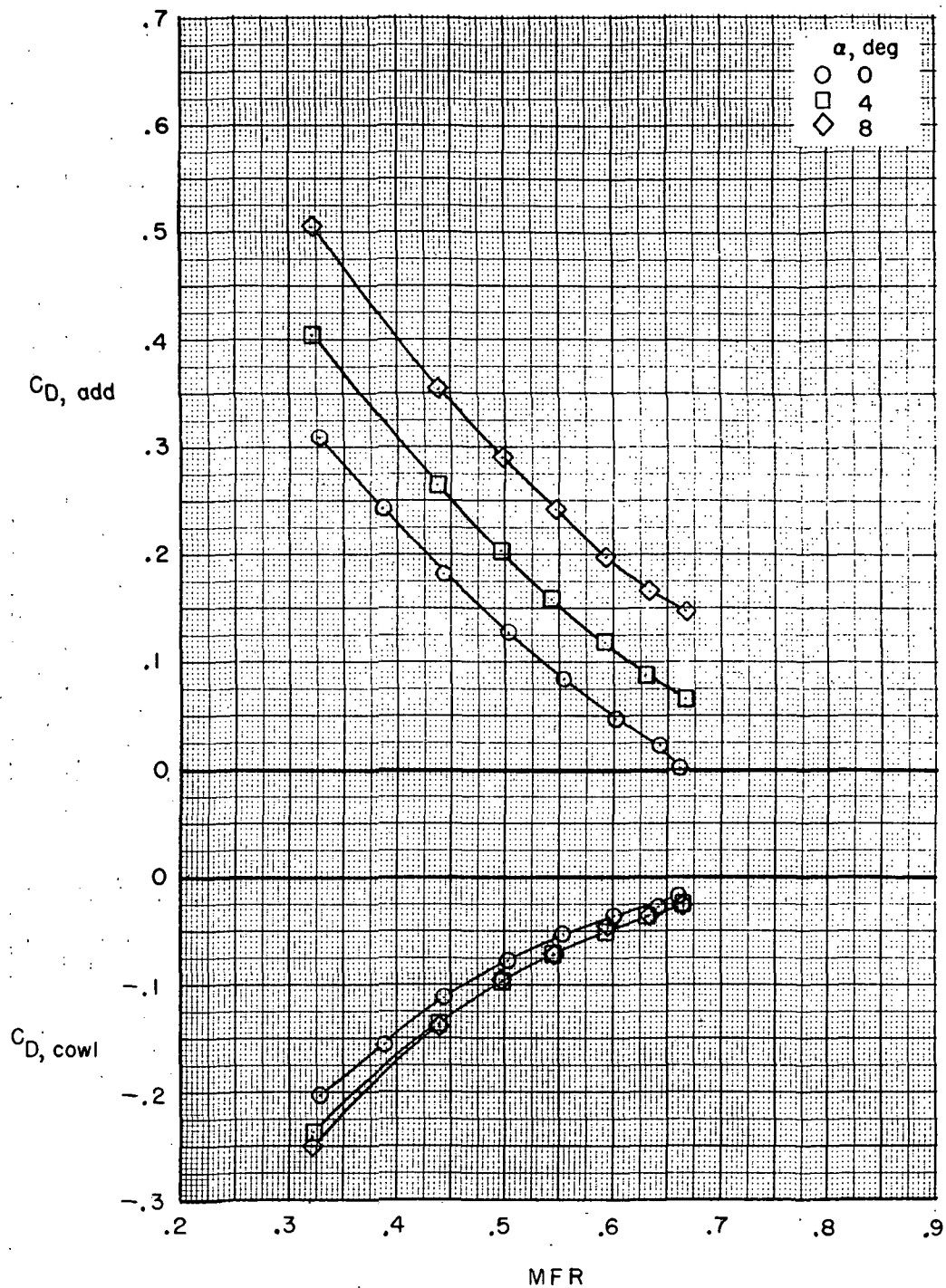
(b) $M = 0.7$.

Figure 4.- Continued.



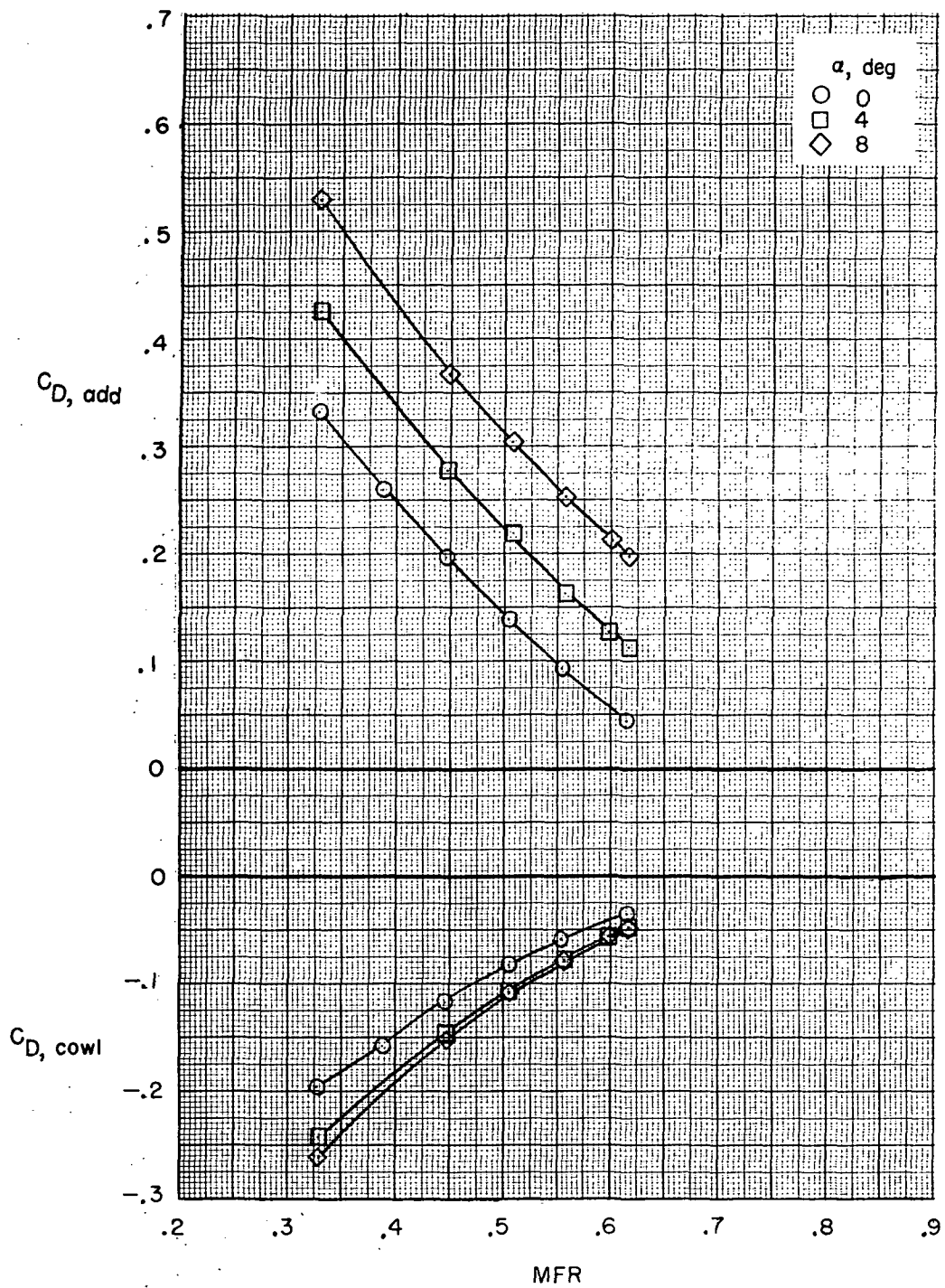
(c) $M = 0.8$.

Figure 4.- Concluded.



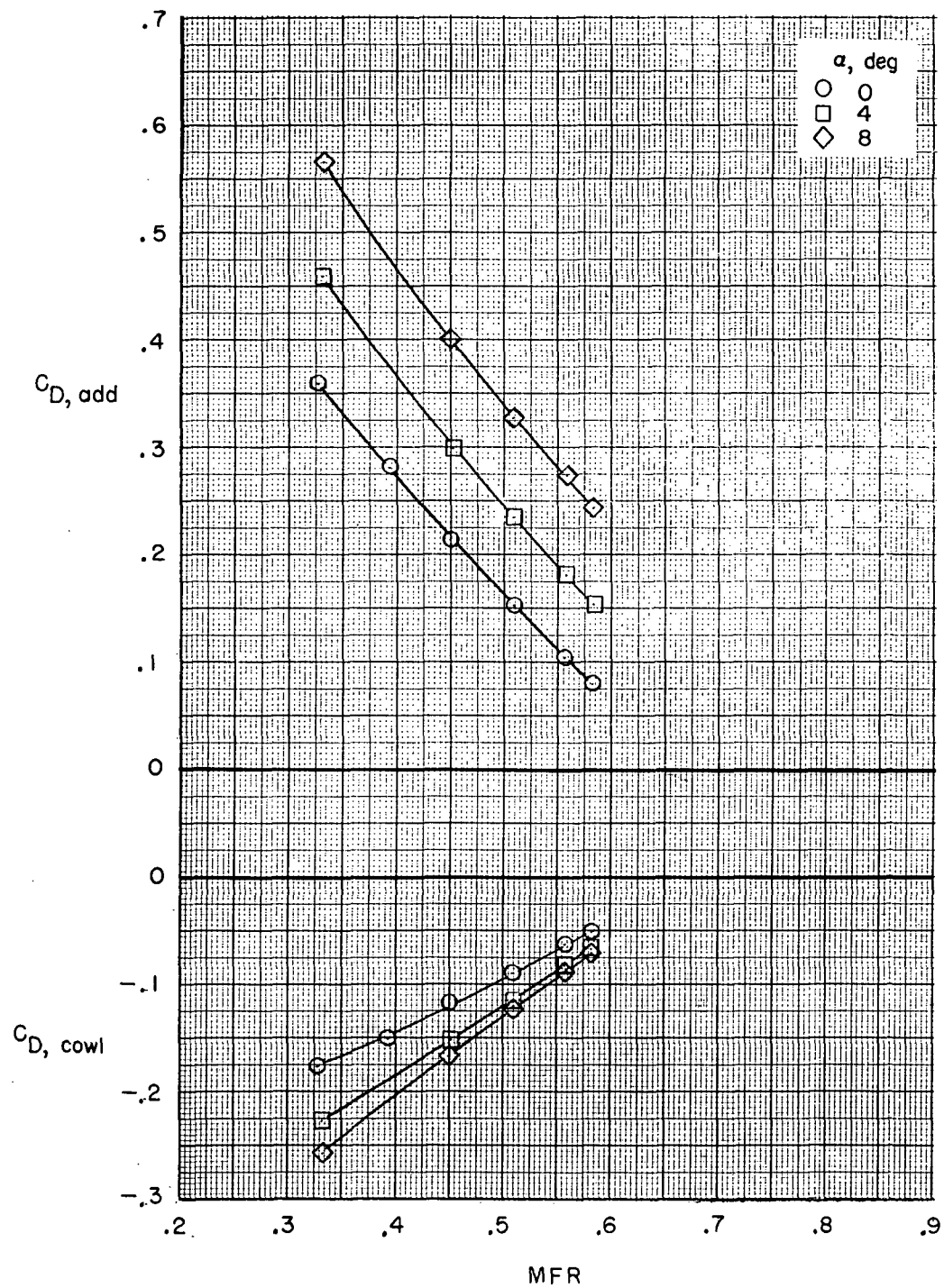
(a) $M = 0.6$.

Figure 5.- Additive and cowl drag characteristics. Cowl 90-1; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



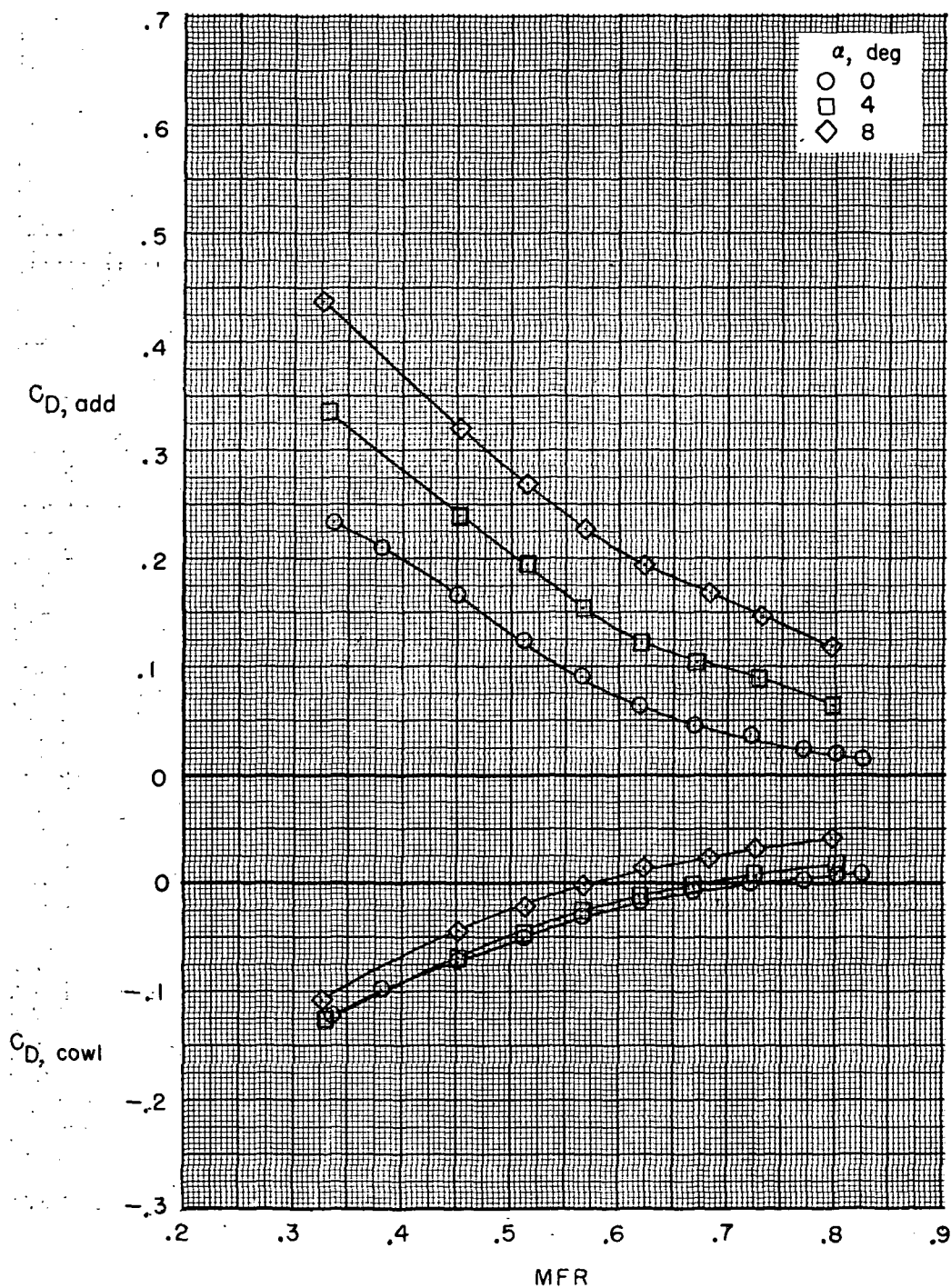
(b) $M = 0.7$.

Figure 5.- Continued.



(c) $M = 0.8$.

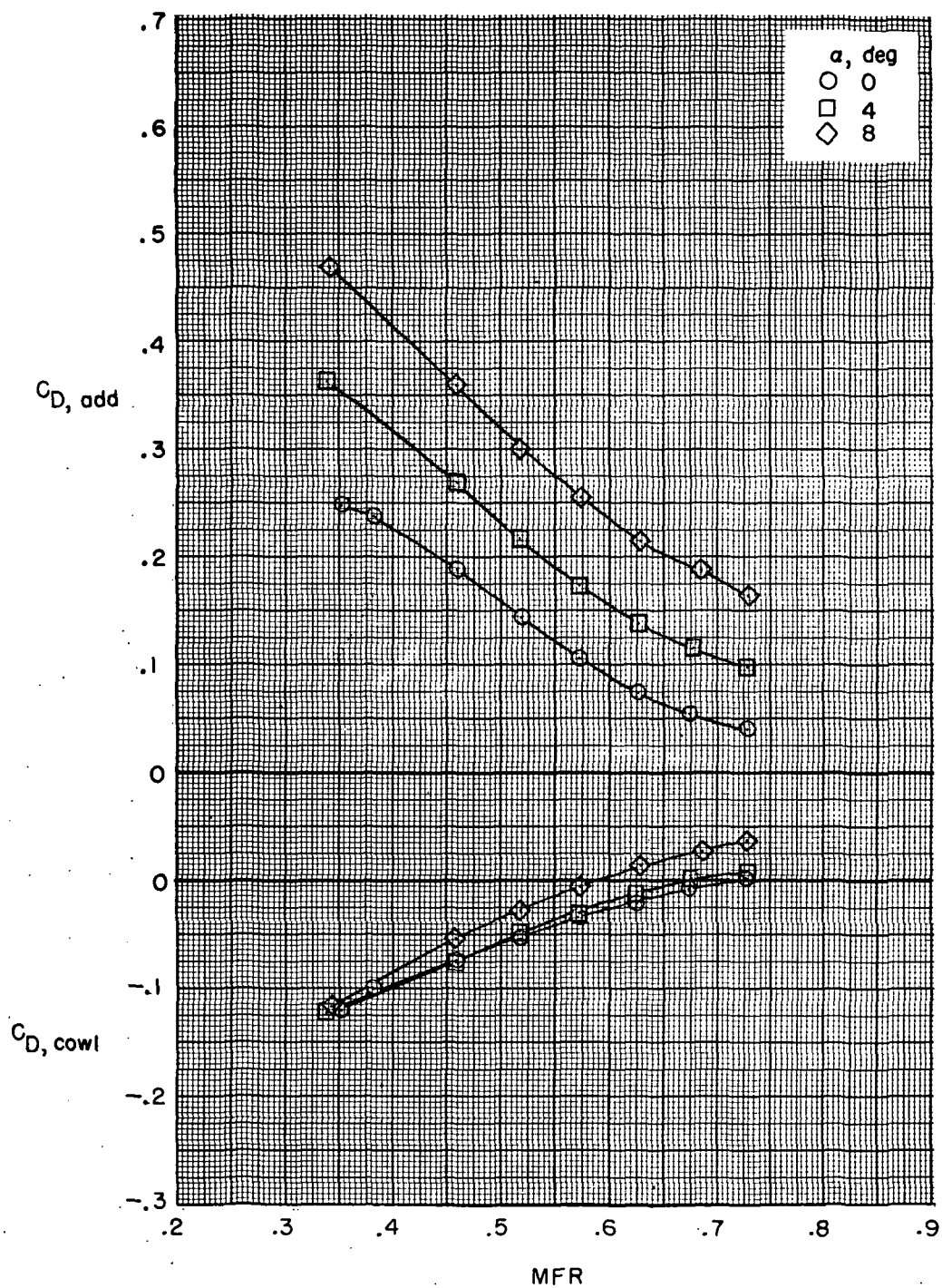
Figure 5.- Concluded.



(a) $M = 0.6$.

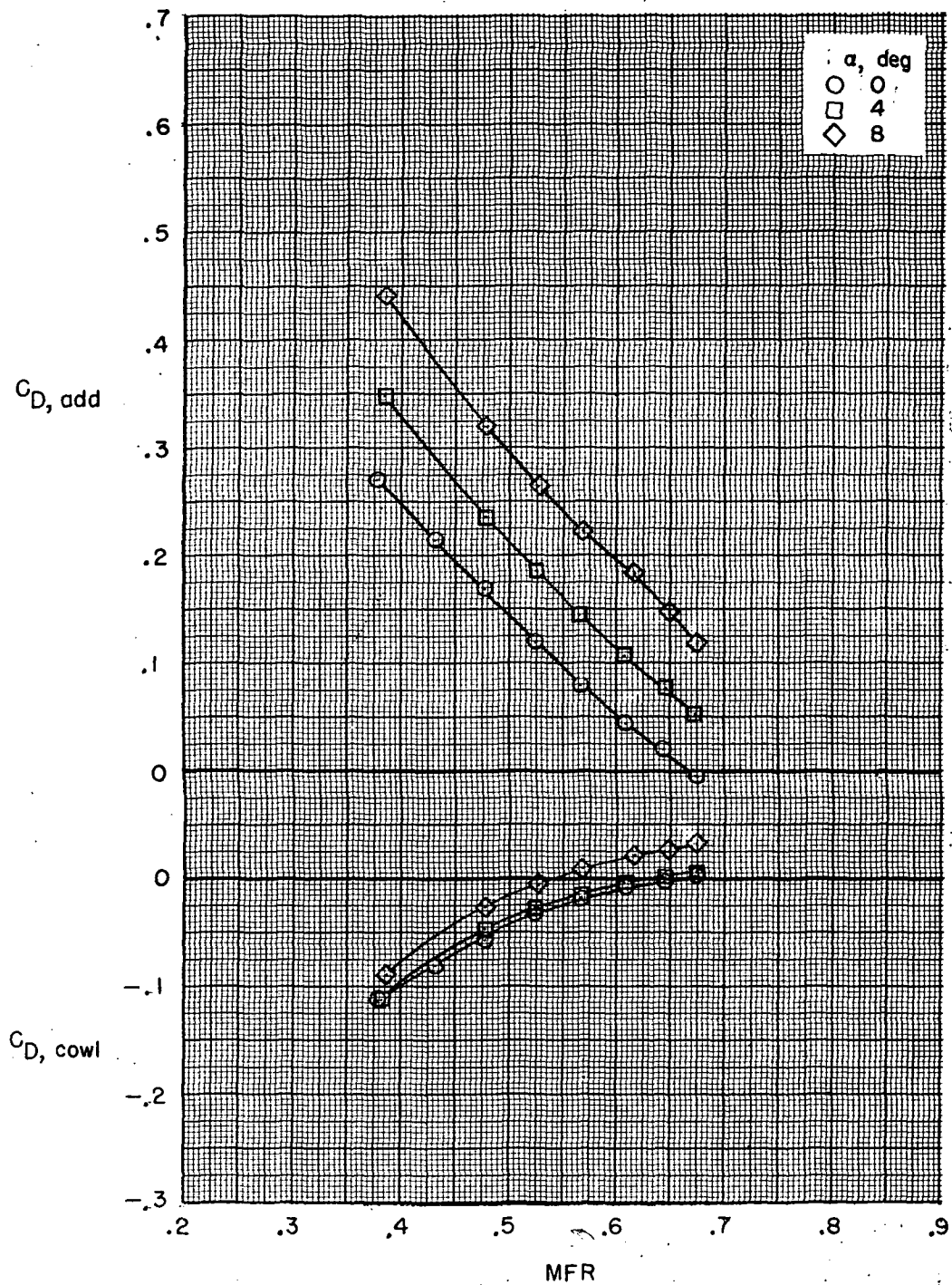
Figure 6.- Additive and cowl drag characteristics.

Cowl 90-1; $\delta_1 = \delta_2 = 5^\circ$; swept sideplate.



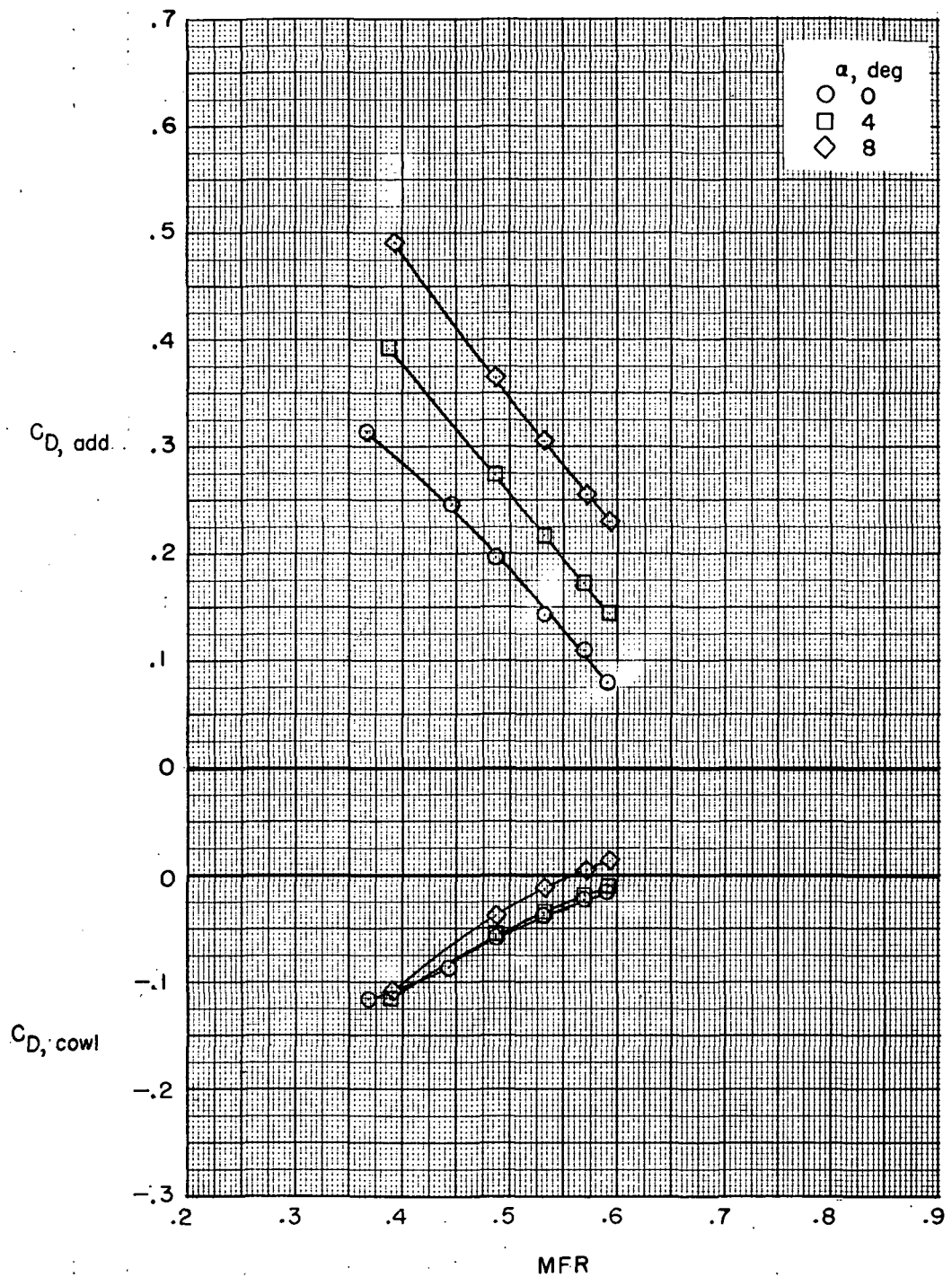
(b) $M = 0.8$.

Figure 6.- Concluded.



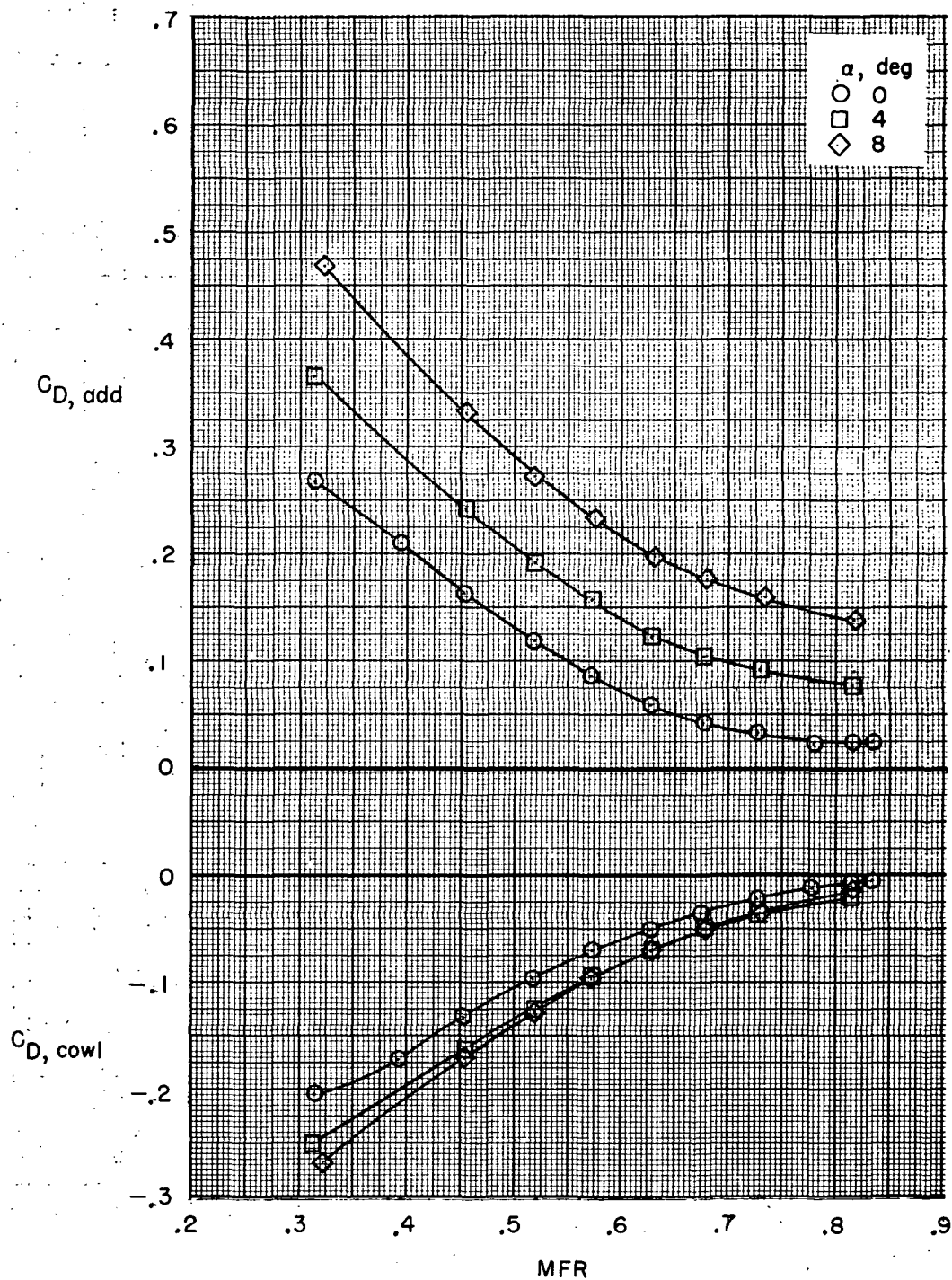
(a) $M = 0.6$.

Figure 7.- Additive and cowl drag characteristics. Cowl 90-1;
 $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$; swept sideplate.



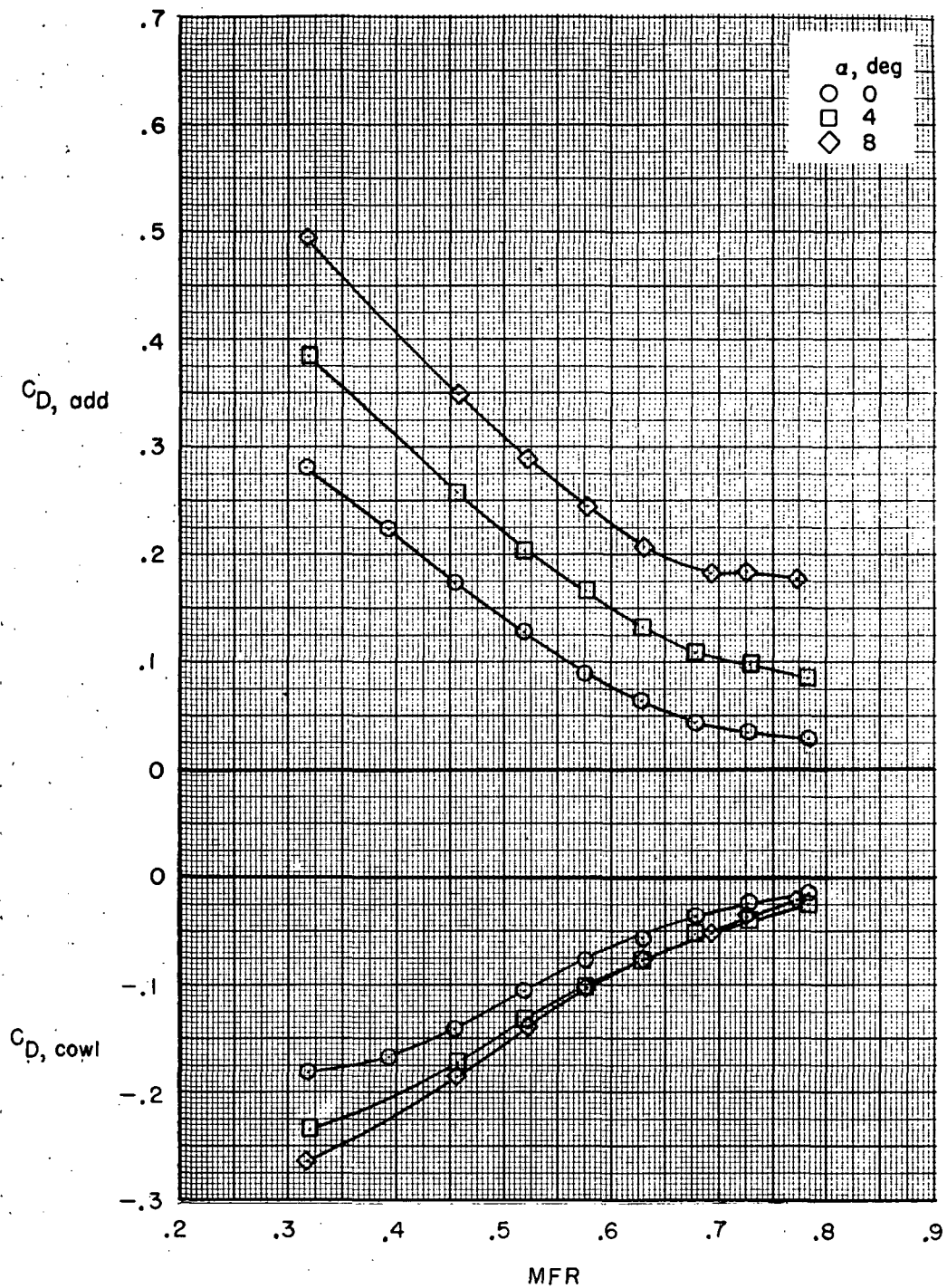
(b) $M = 0.8$.

Figure 7.- Concluded.



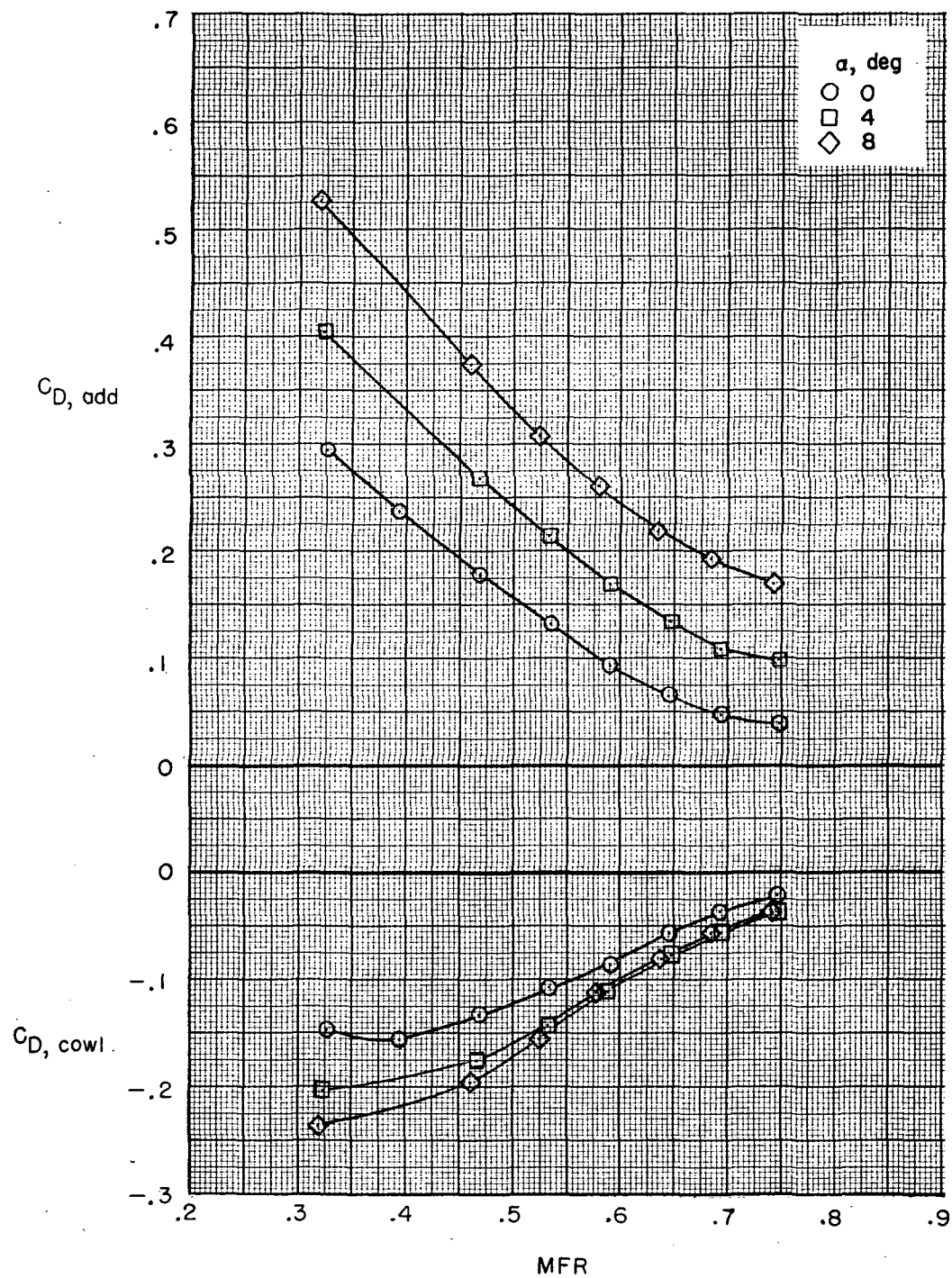
(a) $M = 0.6$.

Figure 8.- Additive and cowl drag characteristics. Cowl 90-2; $\delta_1 = \delta_2 = 5^\circ$.



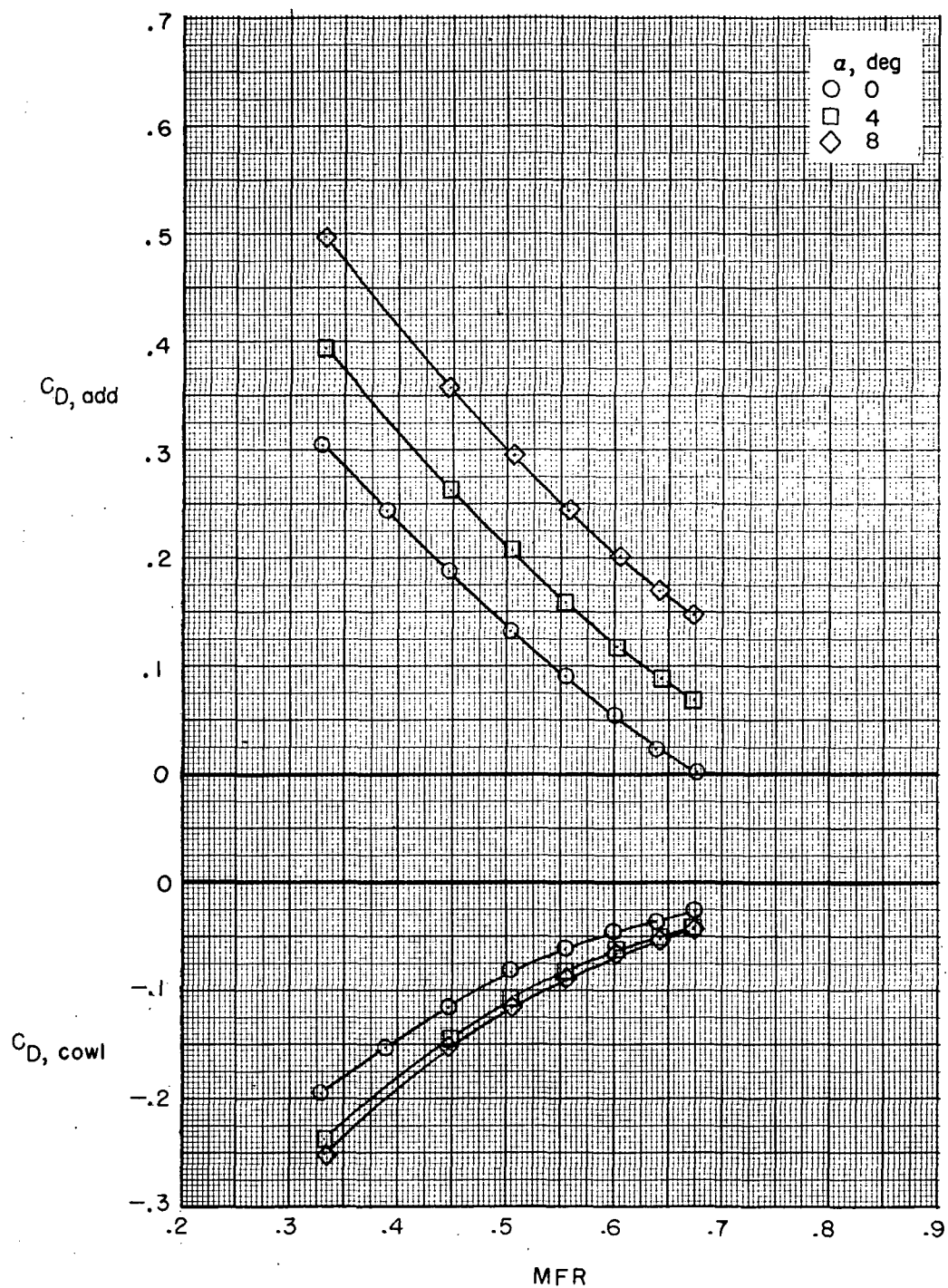
(b) $M = 0.7$.

Figure 8. - Continued.



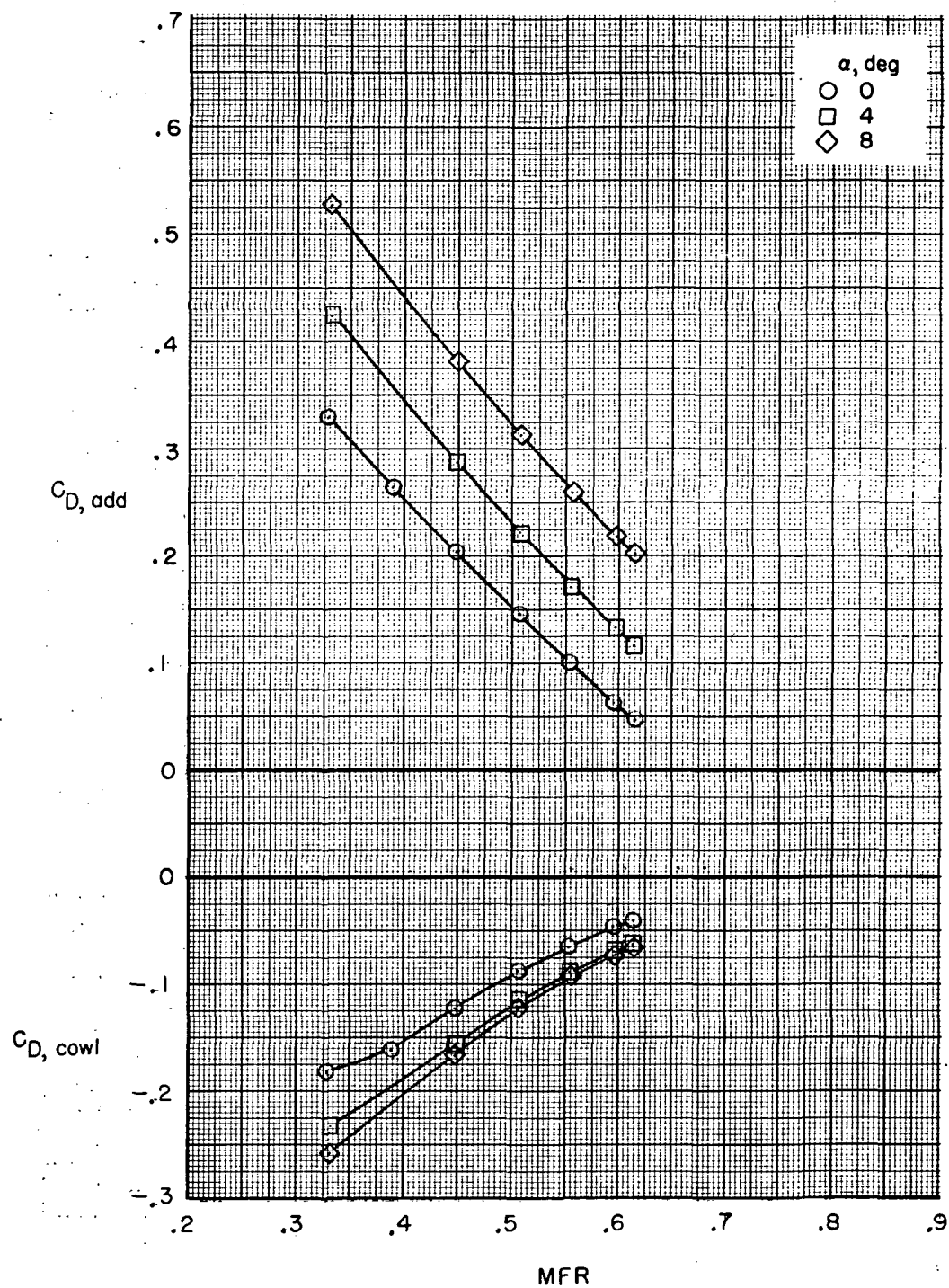
(c) $M = 0.8$.

Figure 8.- Concluded.



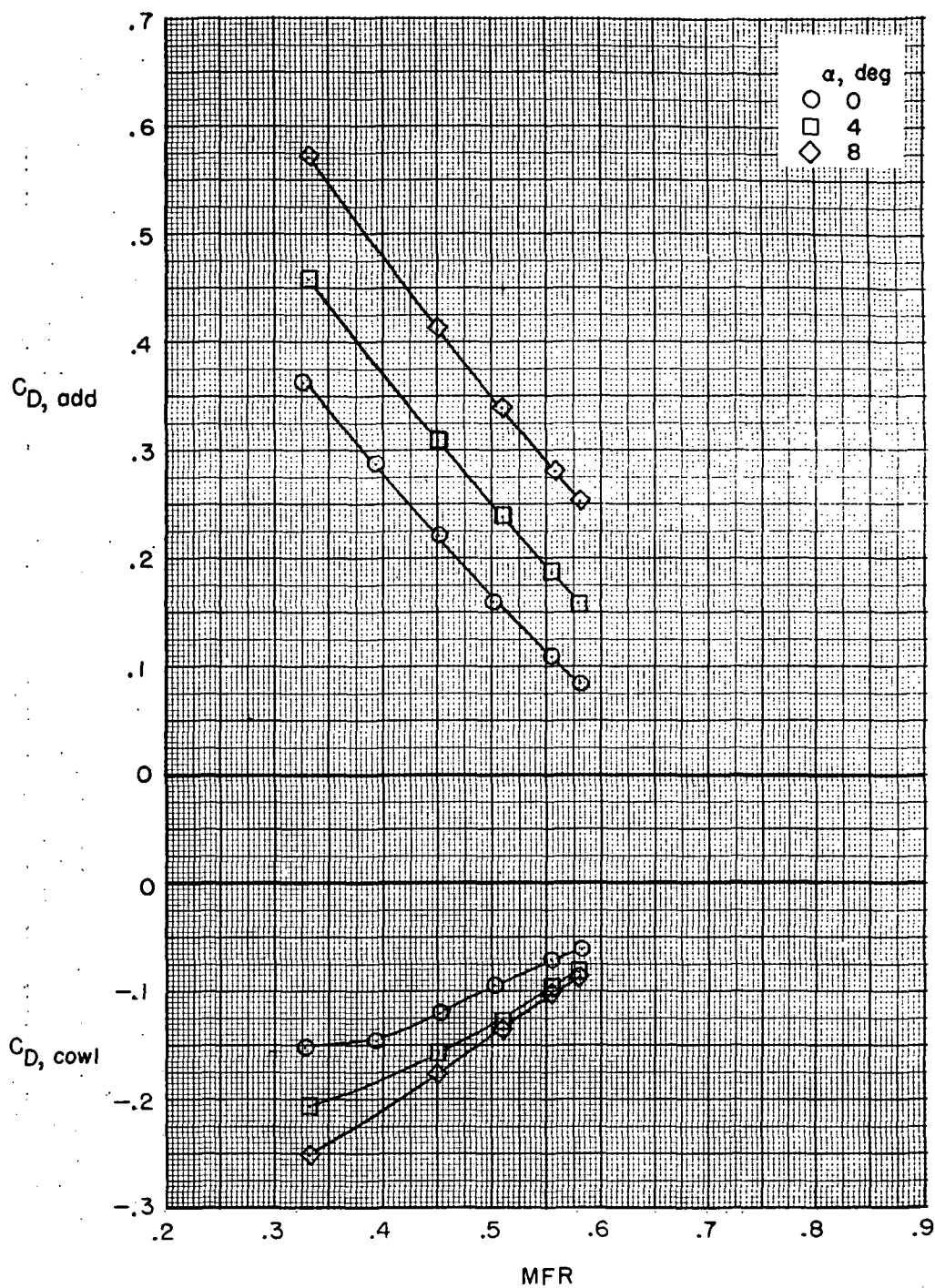
(a) $M = 0.6$.

Figure 9.- Additive and cowl drag characteristics. Cowl 90-2; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



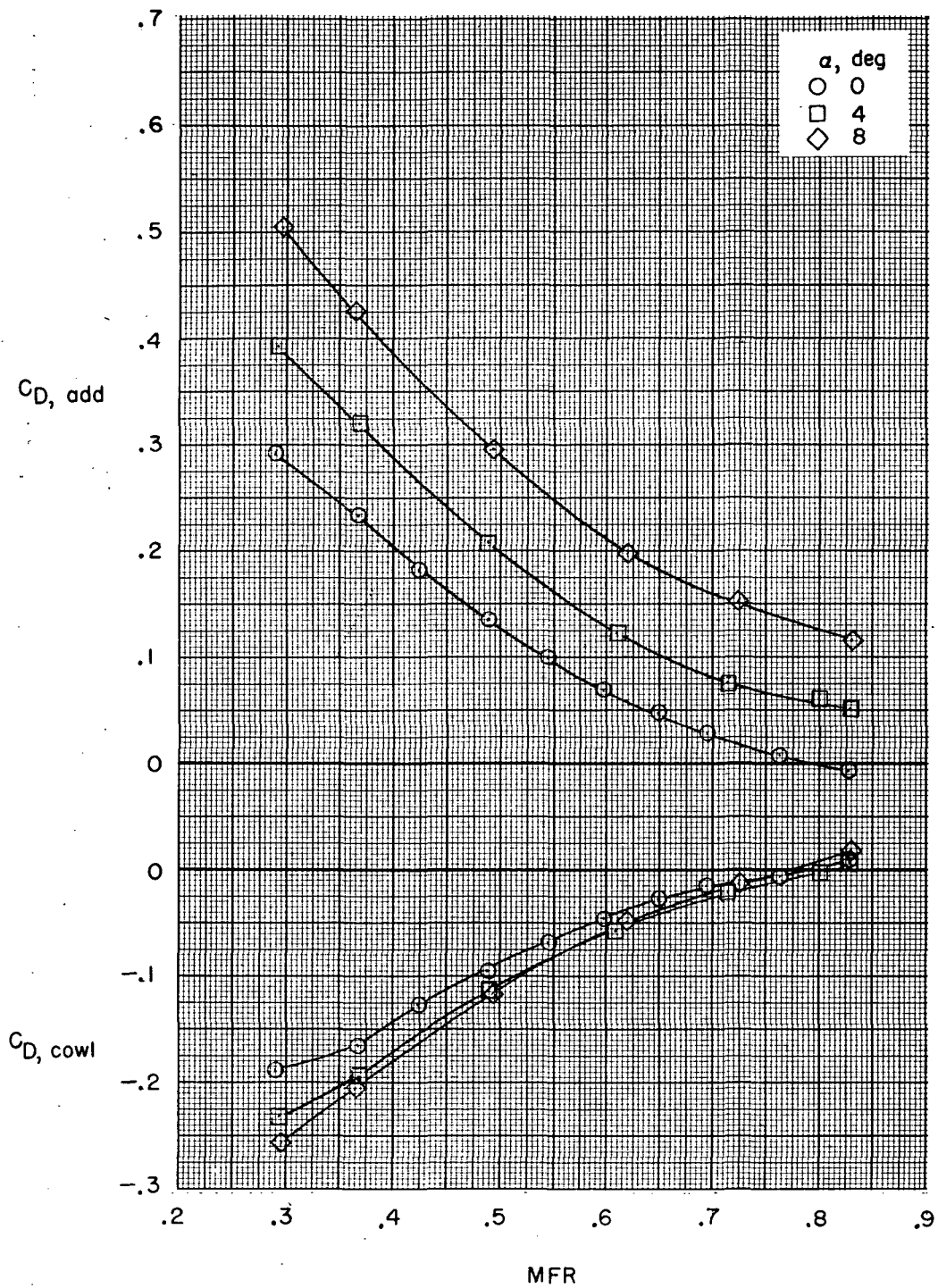
(b) $M = 0.7$.

Figure 9.- Continued.



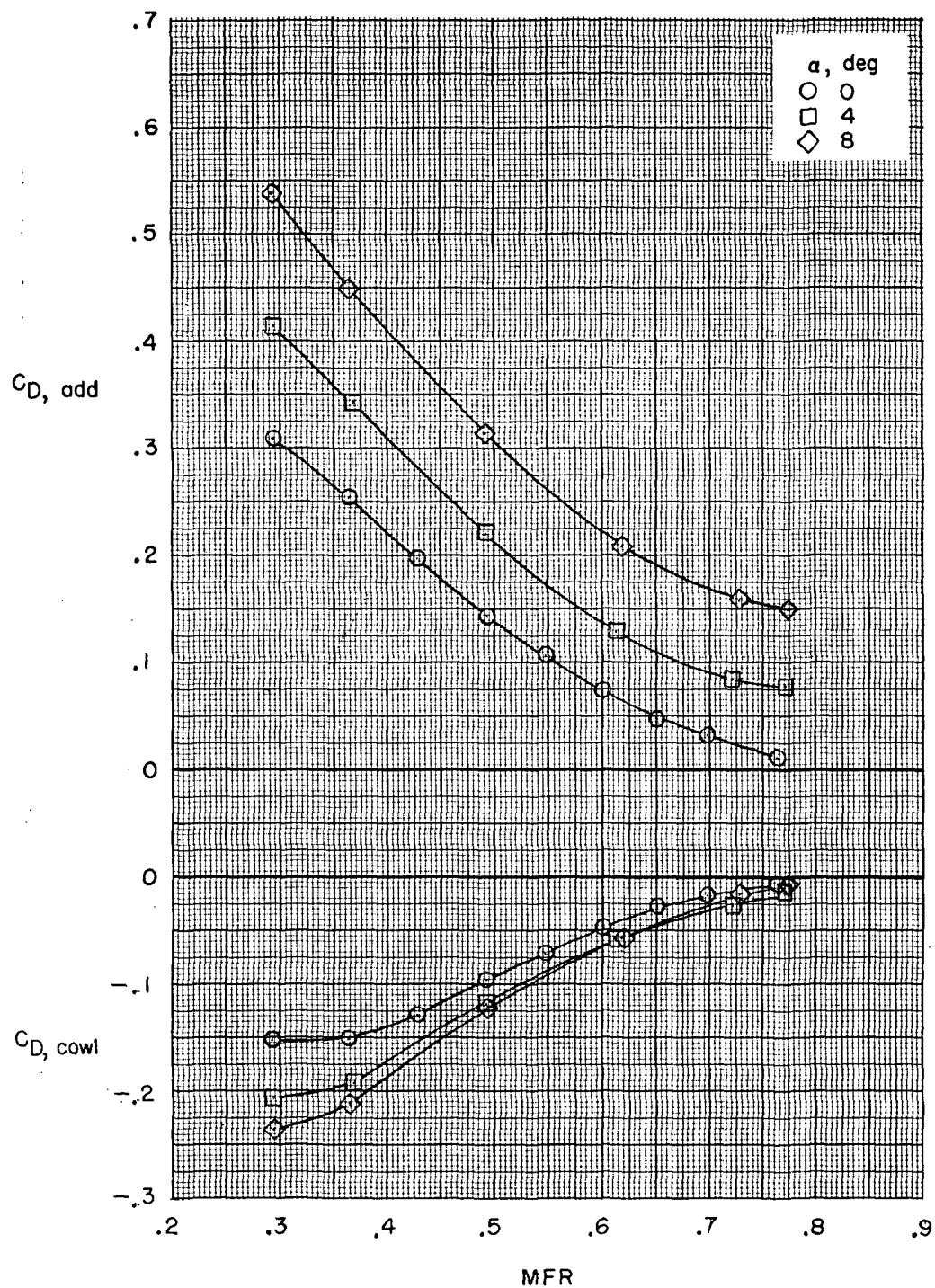
(c) $M = 0.8$.

Figure 9.- Concluded.



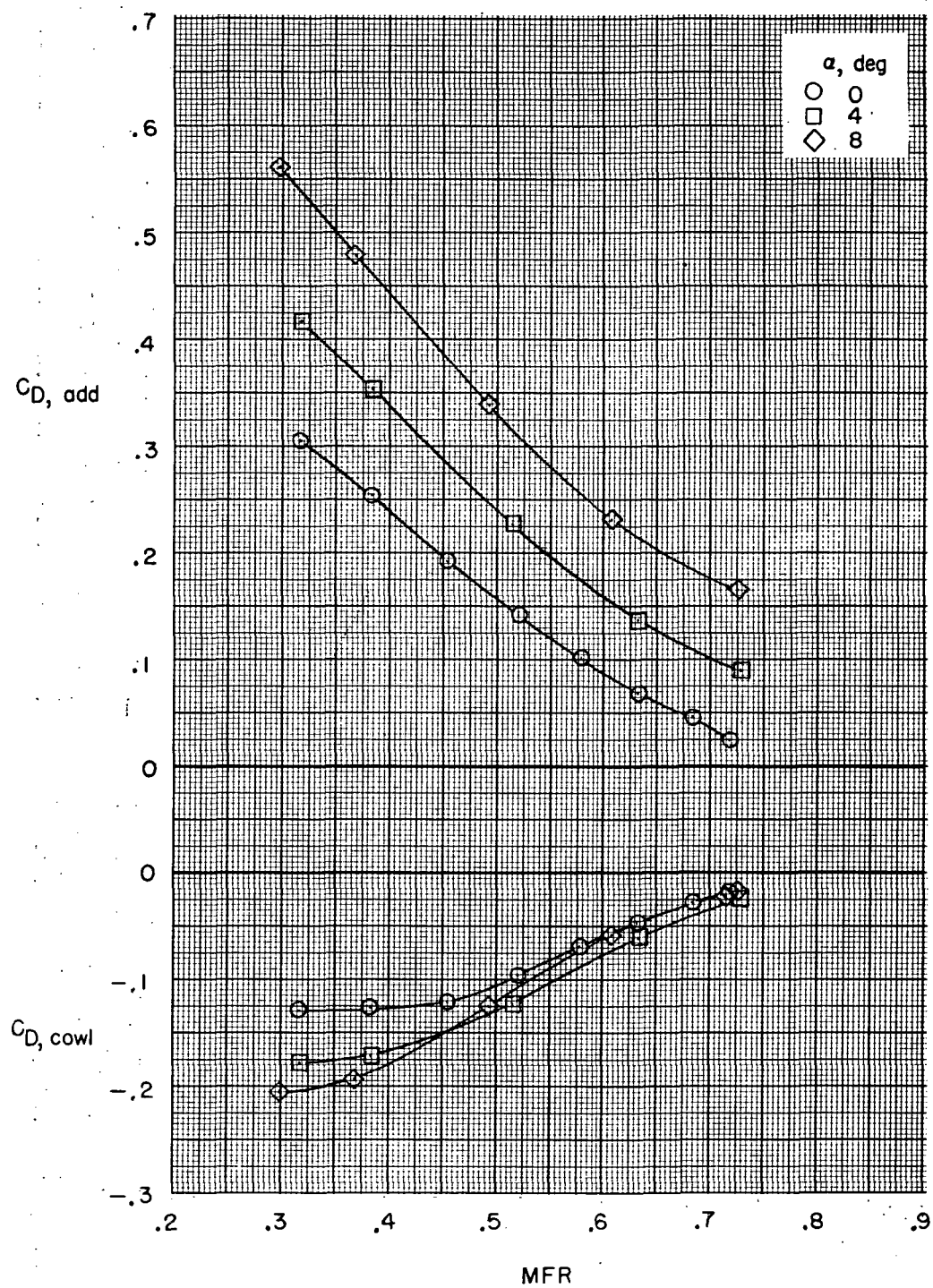
(a) $M = 0.6$.

Figure 10.- Additive and cowl drag characteristics. Cowl 90-3; $\delta_1 = \delta_2 = 5^\circ$.



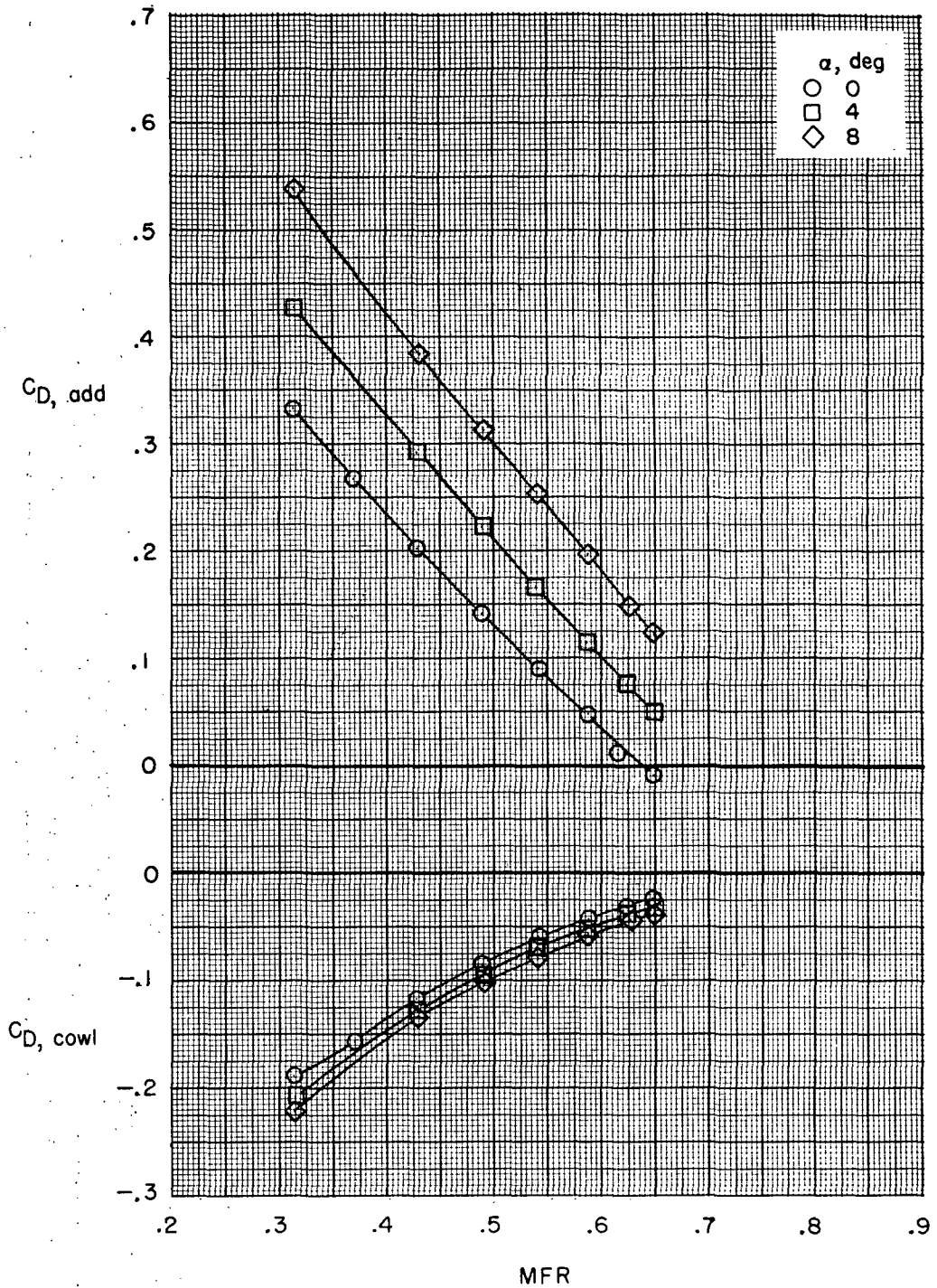
(b) $M = 0.7$.

Figure 10.- Continued.



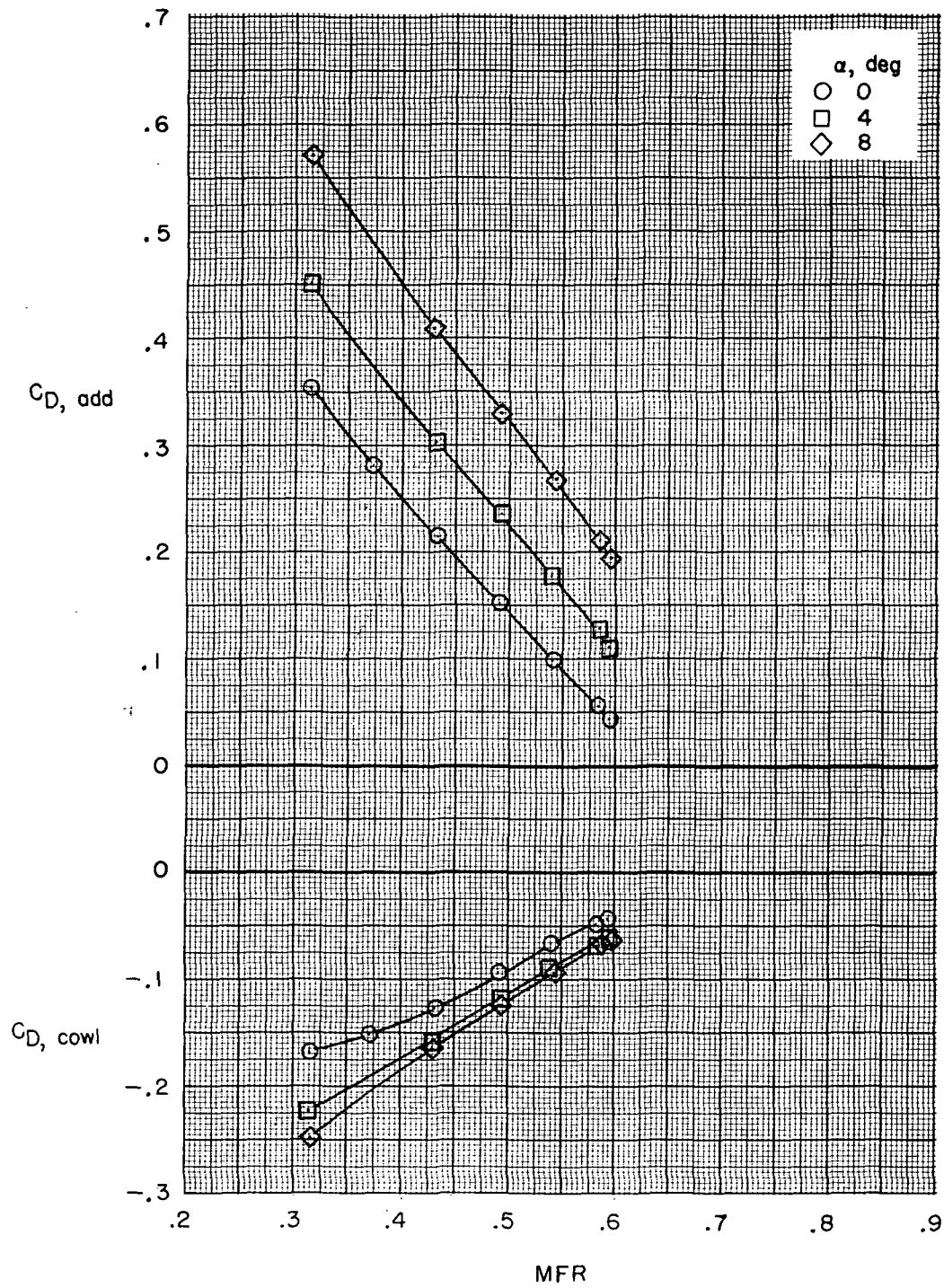
(c) $M = 0.8$.

Figure 10.- Concluded.



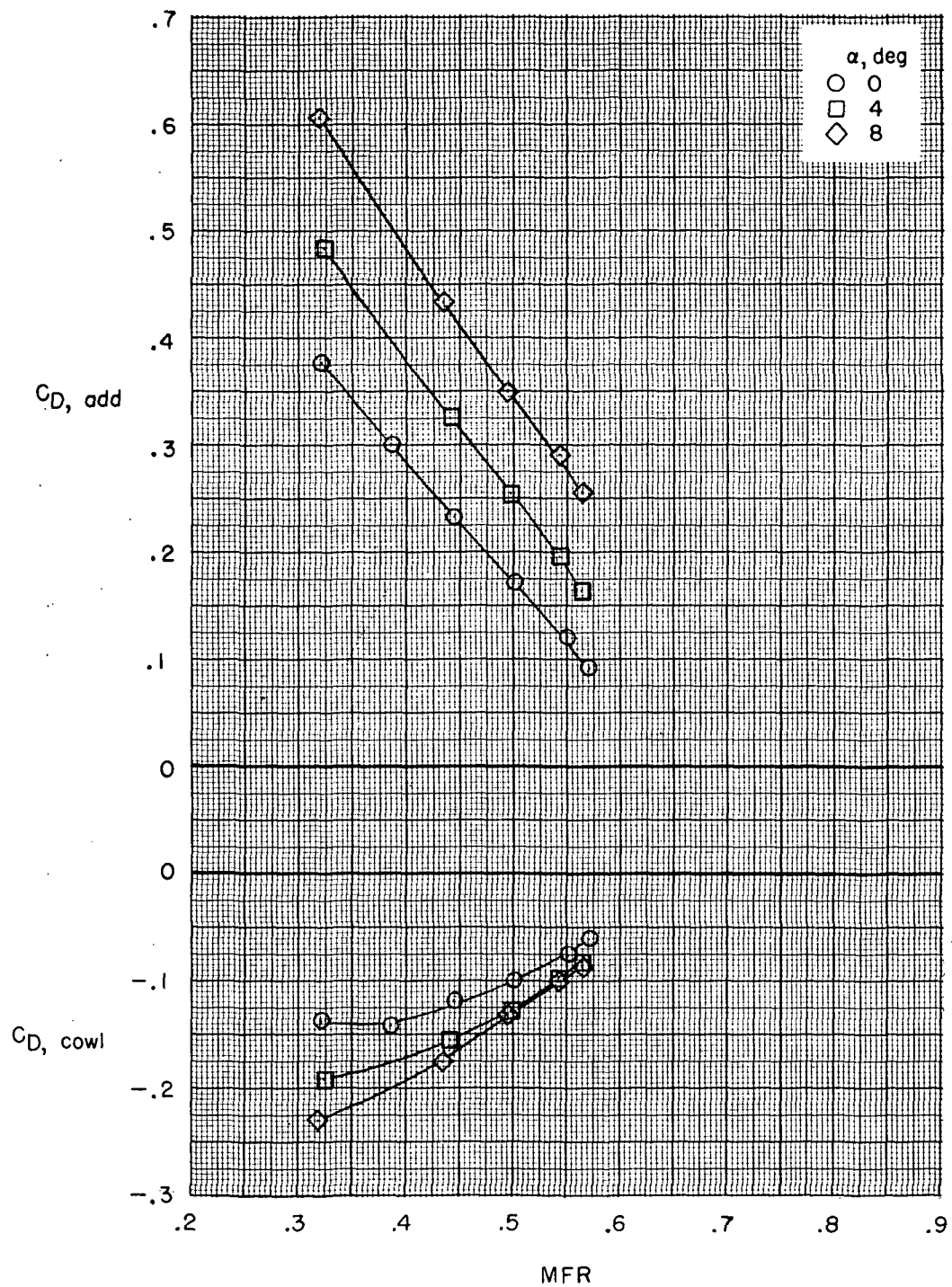
(a) $M = 0.6$.

Figure 11.- Additive and cowl drag characteristics. Cowl 90-3; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



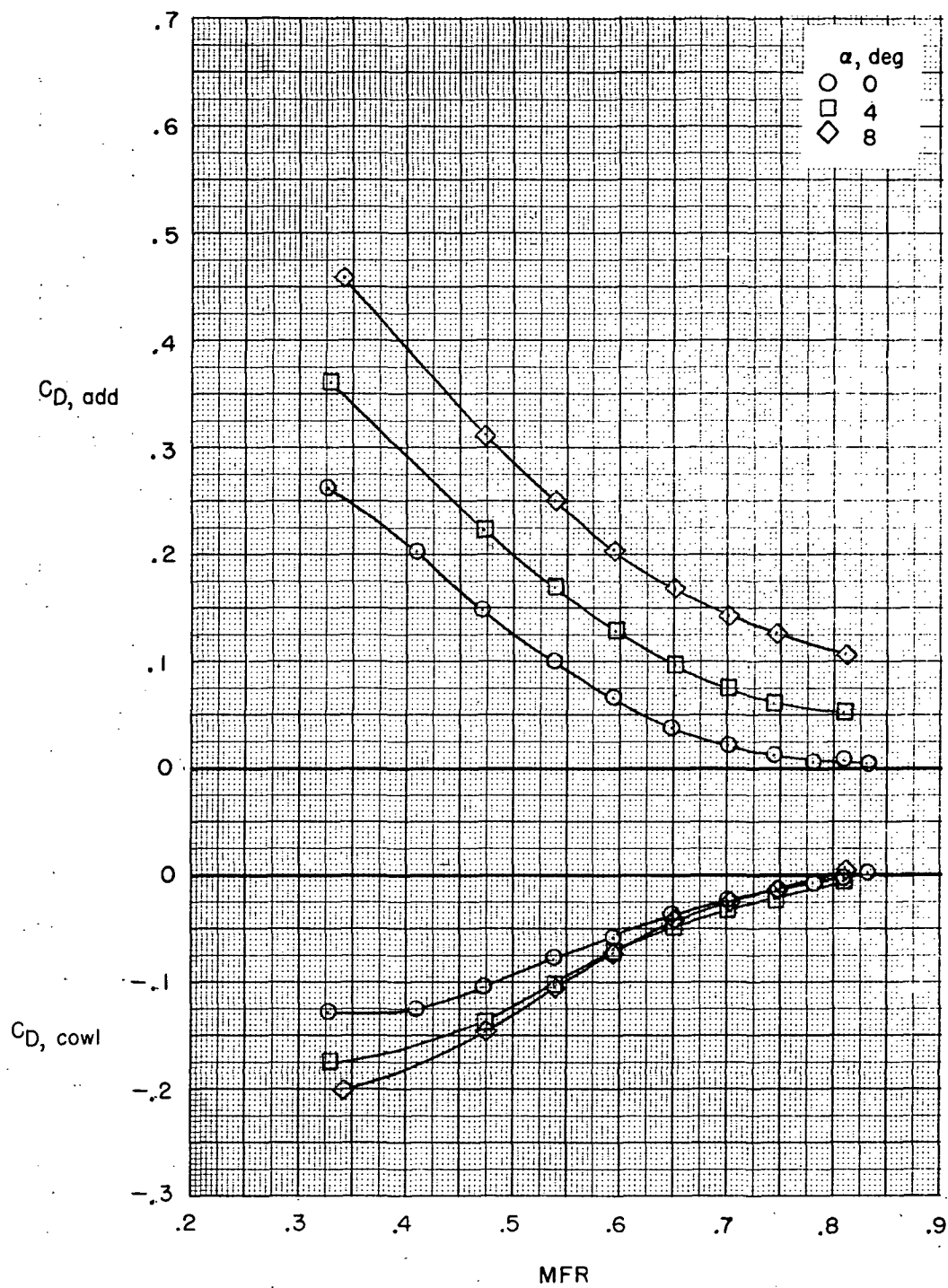
(b) $M = 0.7$.

Figure 11.- Continued.



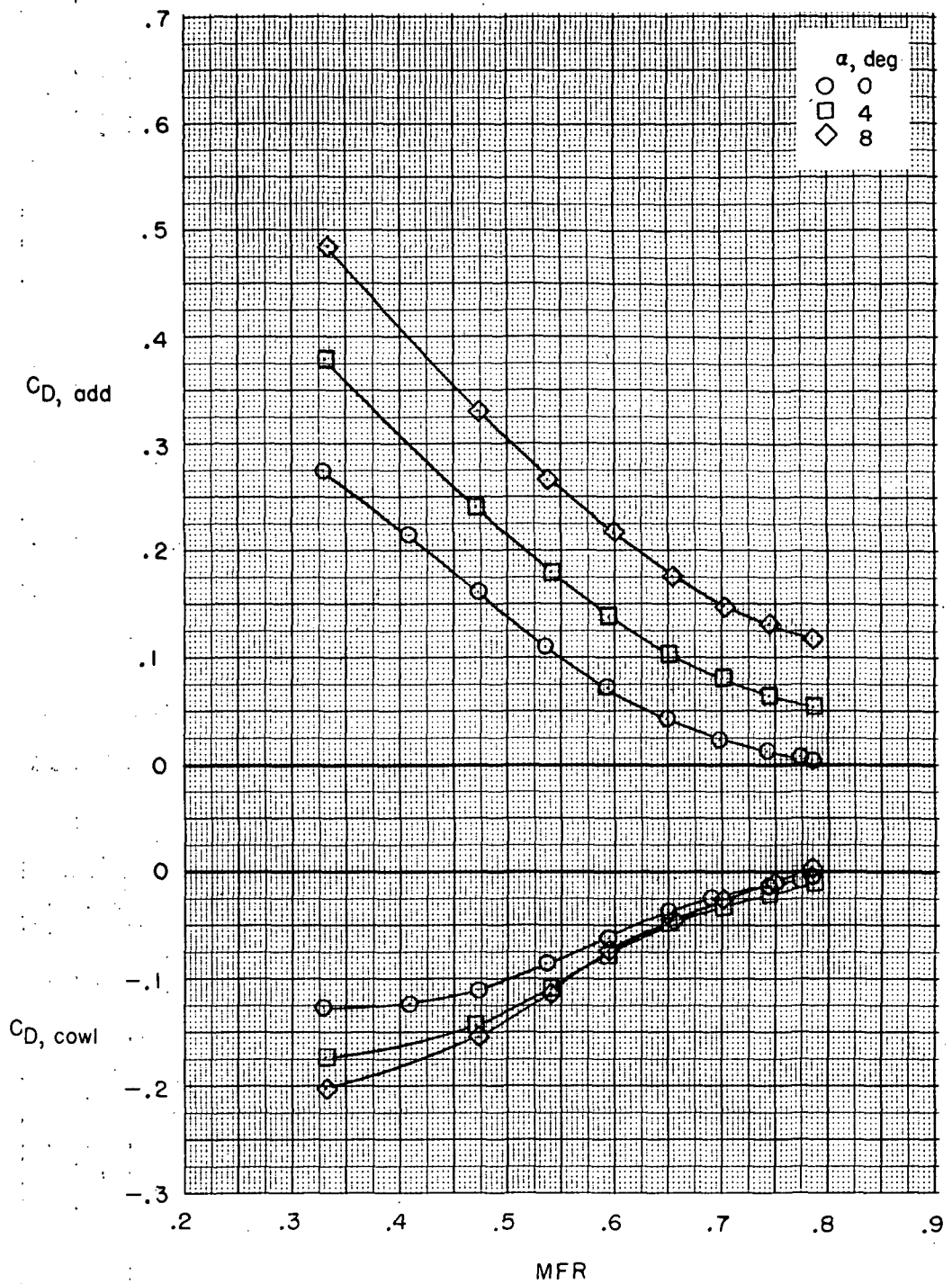
(c) $M = 0.8$.

Figure 11.- Concluded.



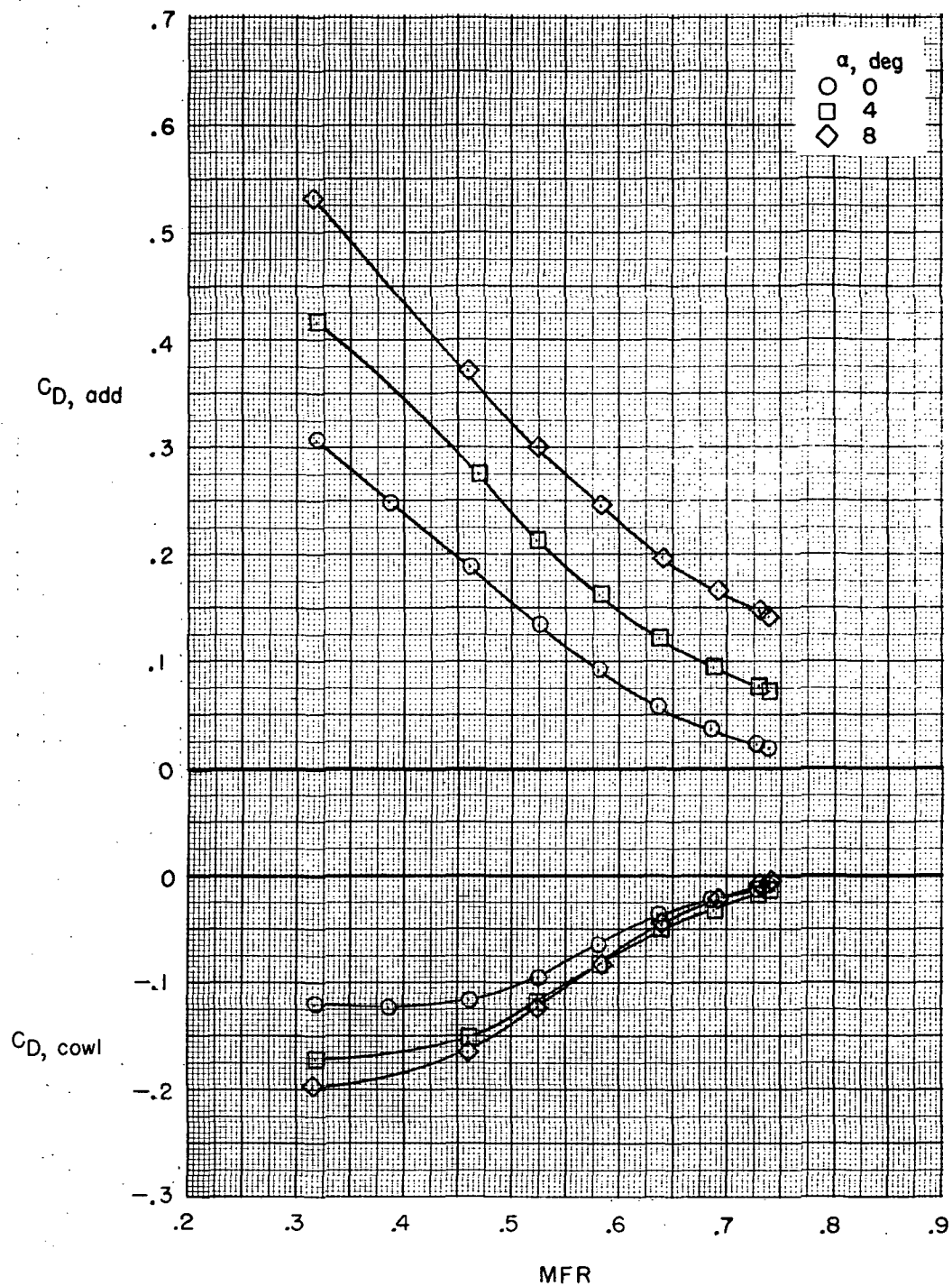
(a) $M = 0.6$.

Figure 12.- Additive and cowl drag characteristics. Cowl 20-0; $\delta_1 = \delta_2 = 5^\circ$.



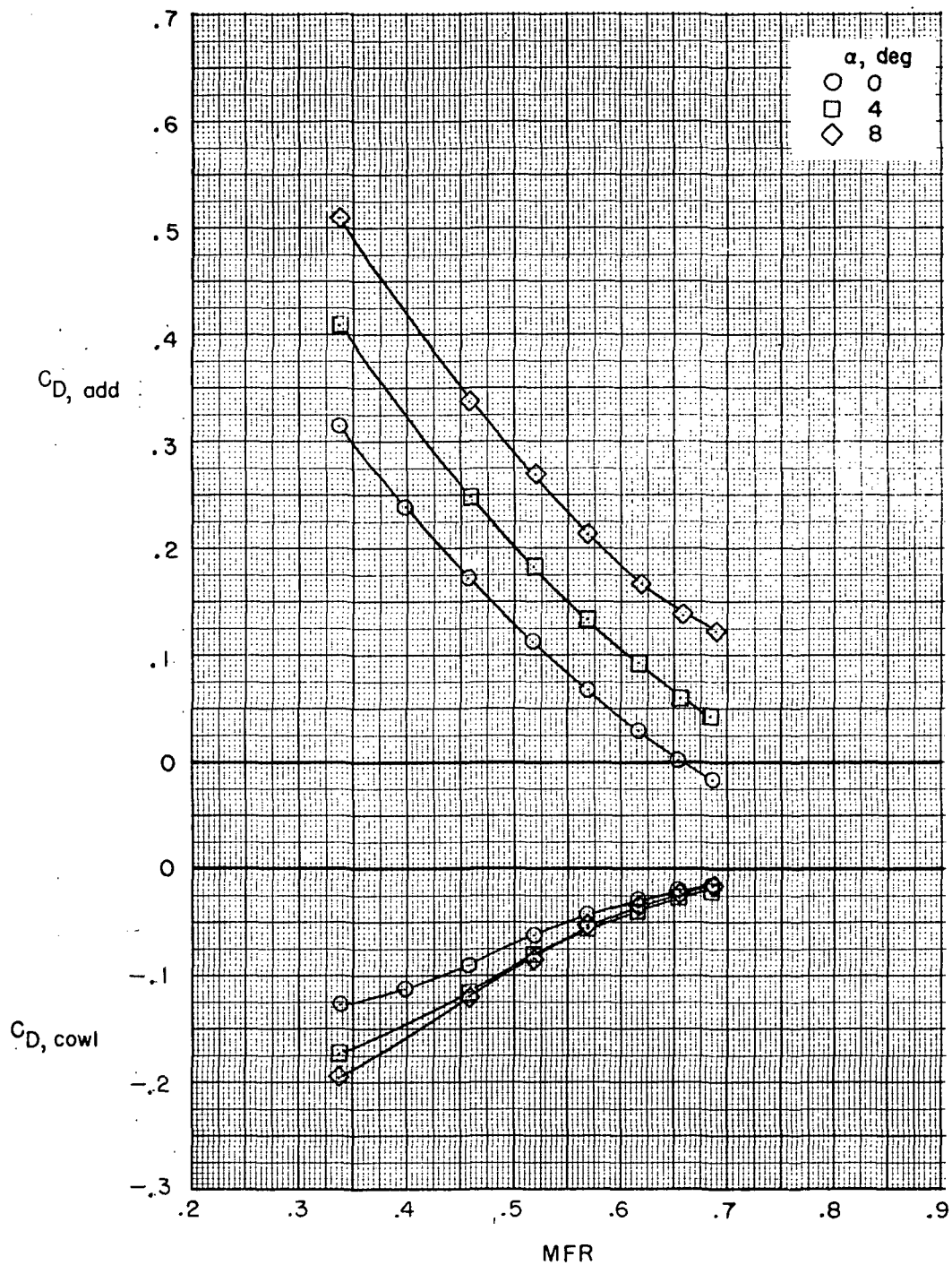
(b) $M = 0.7$.

Figure 12.- Continued.



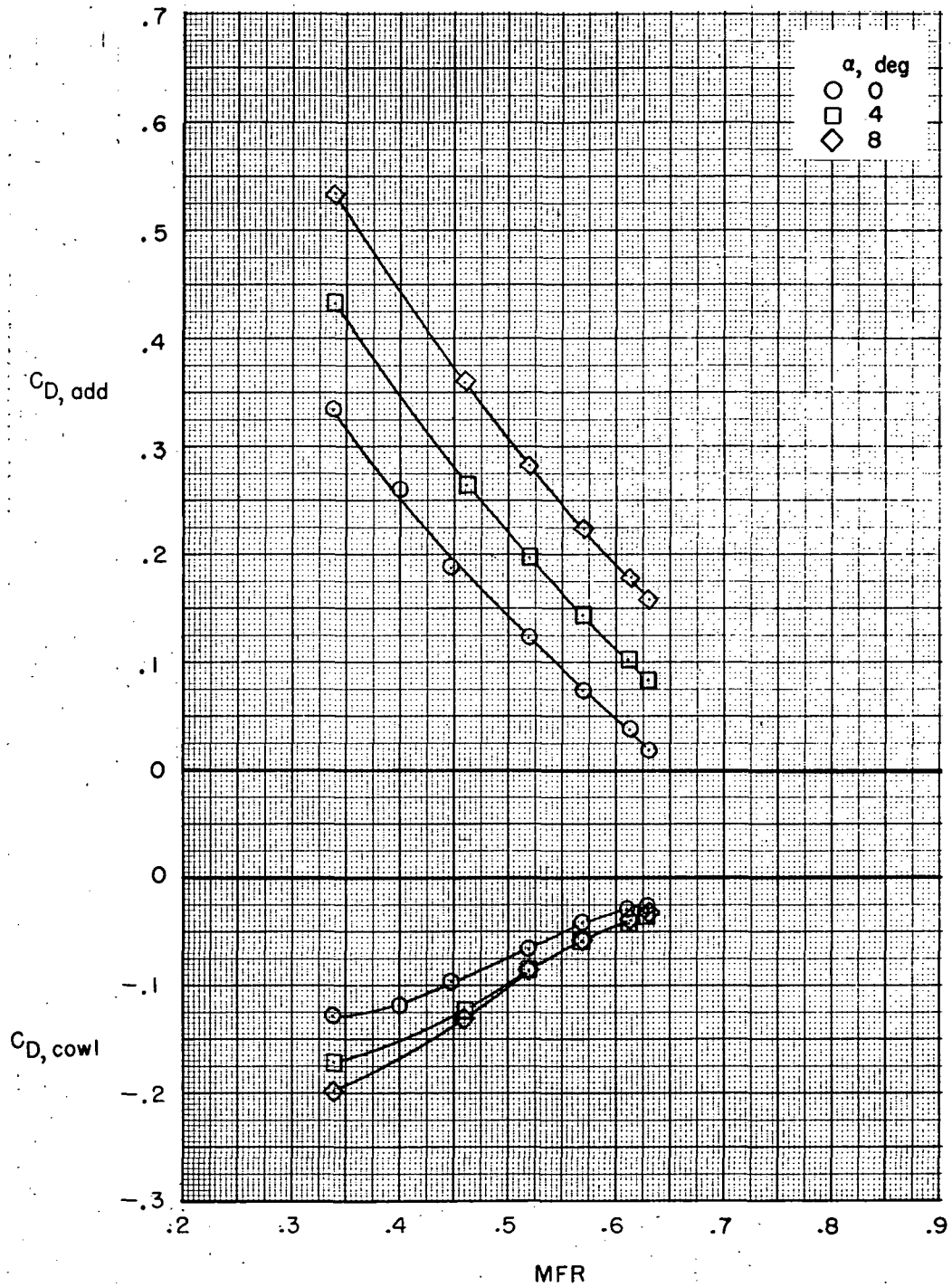
(c) $M = 0.8$.

Figure 12.- Concluded.



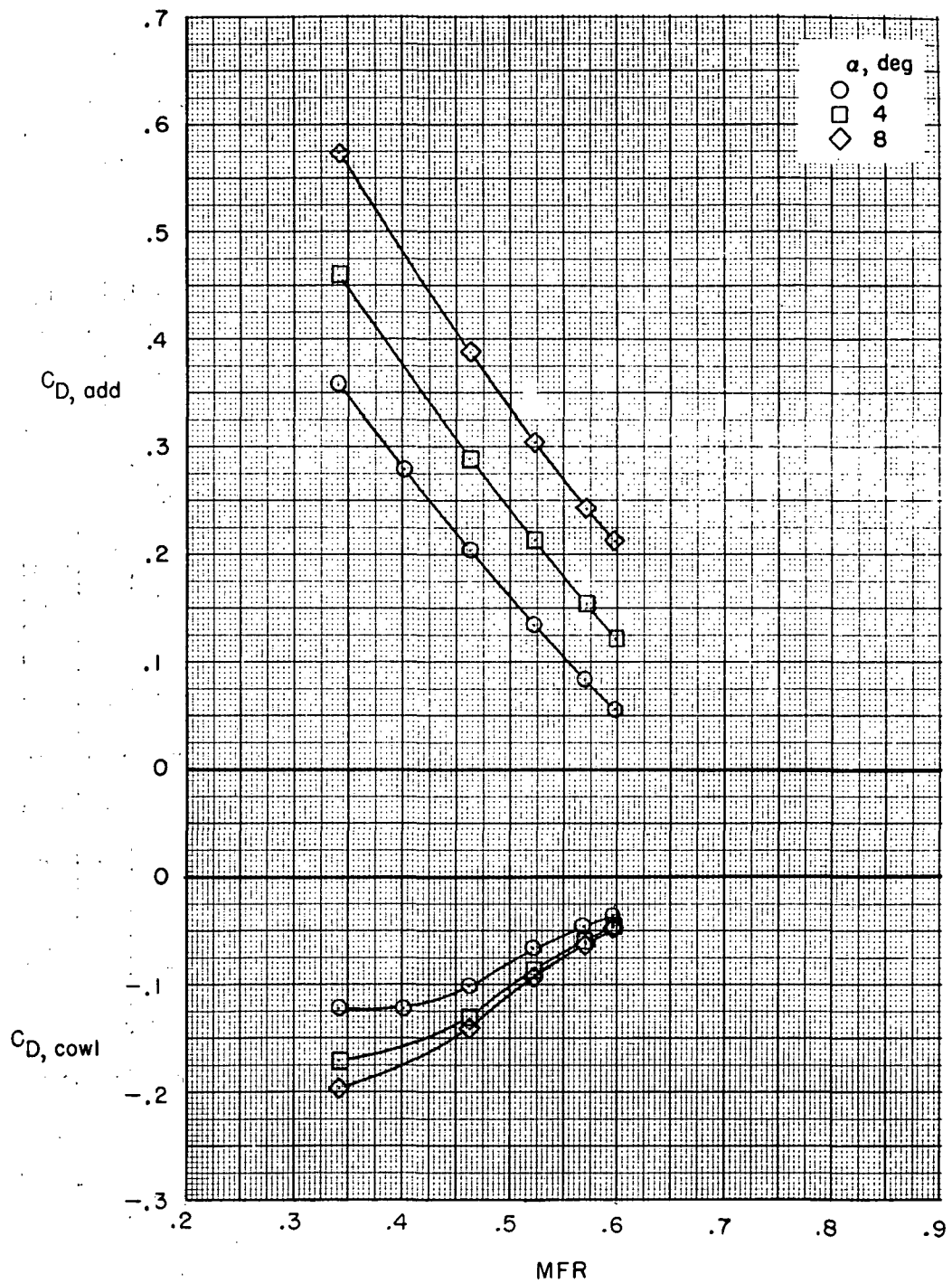
(a) $M = 0.6$.

Figure 13.- Additive and cowl drag characteristics. Cowl 20-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



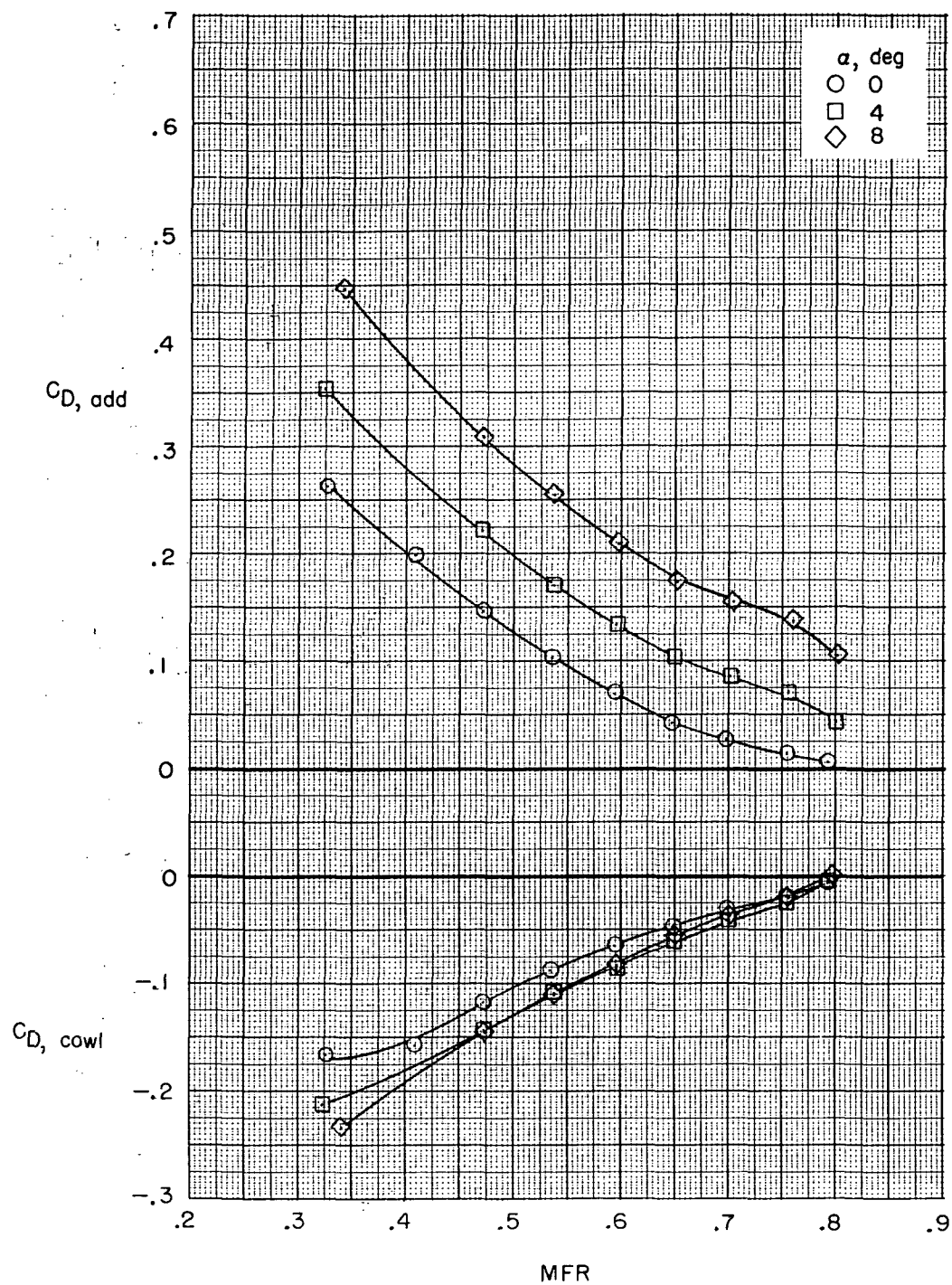
(b) $M = 0.7$.

Figure 13.- Continued.



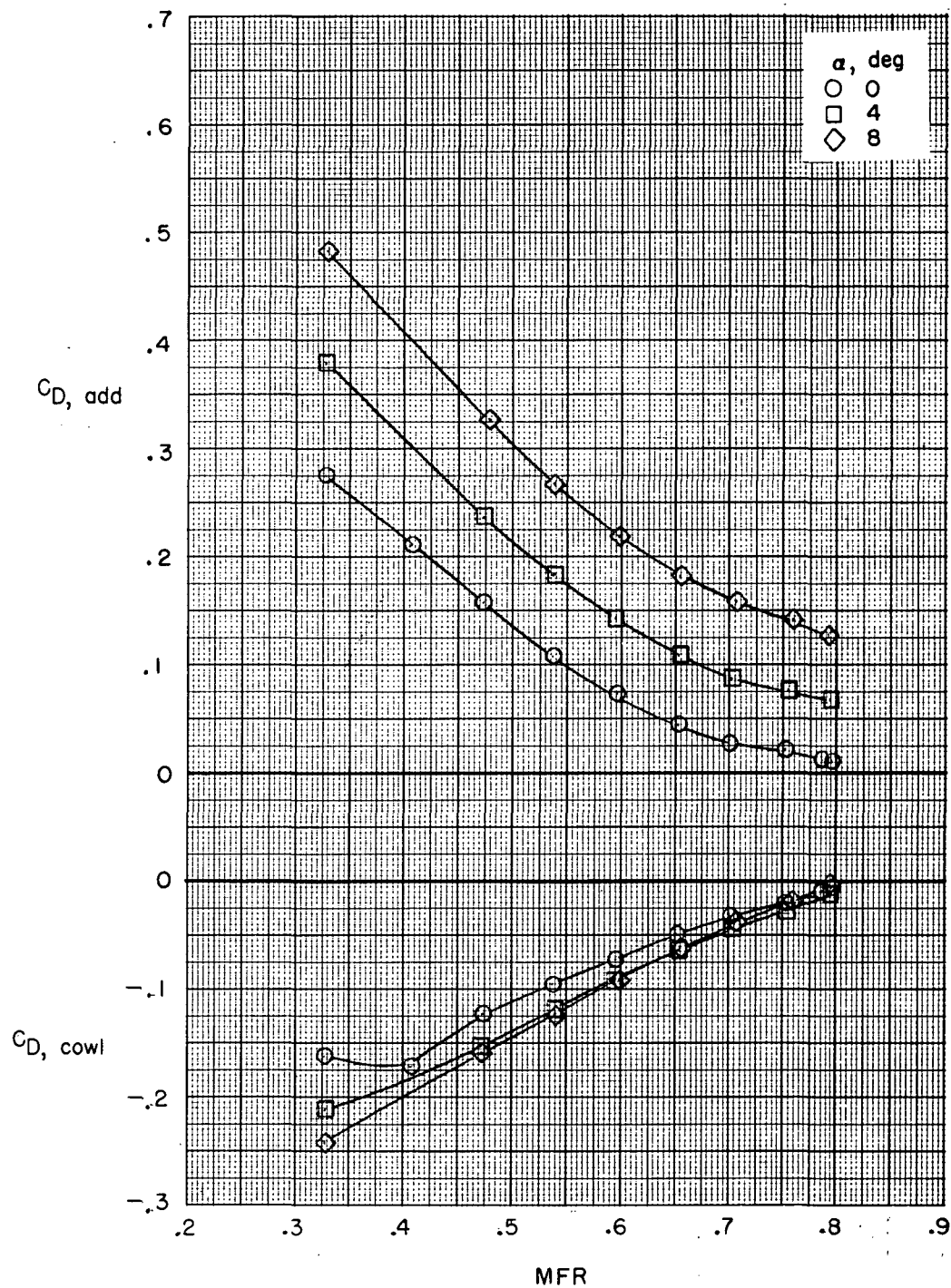
(c) $M = 0.8$.

Figure 13.- Concluded.



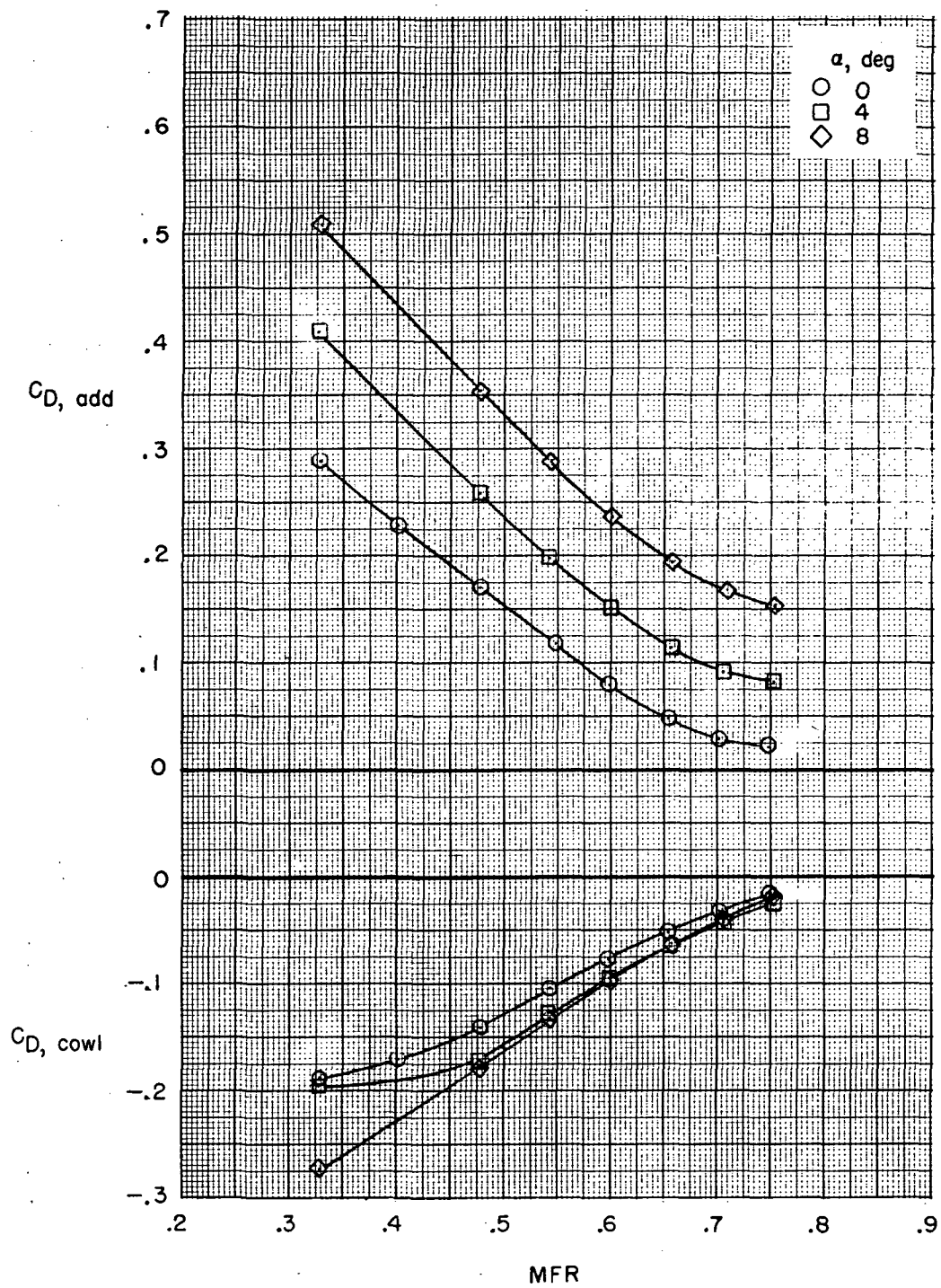
(a) $M = 0.6$.

Figure 14.- Additive and cowl drag characteristics. Cowl 45-0; $\delta_1 = \delta_2 = 5^\circ$.



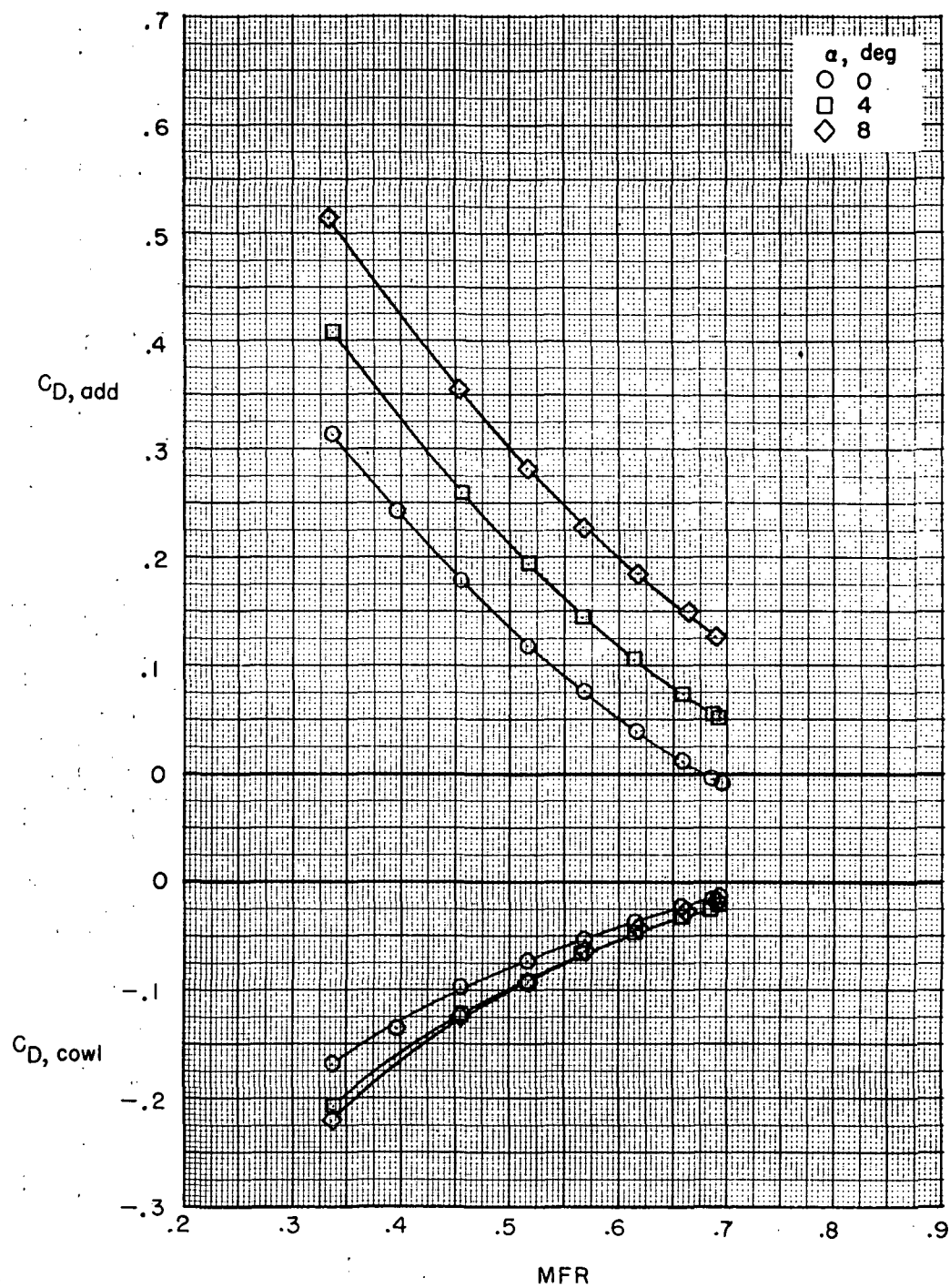
(b) $M = 0.7$.

Figure 14.- Continued.



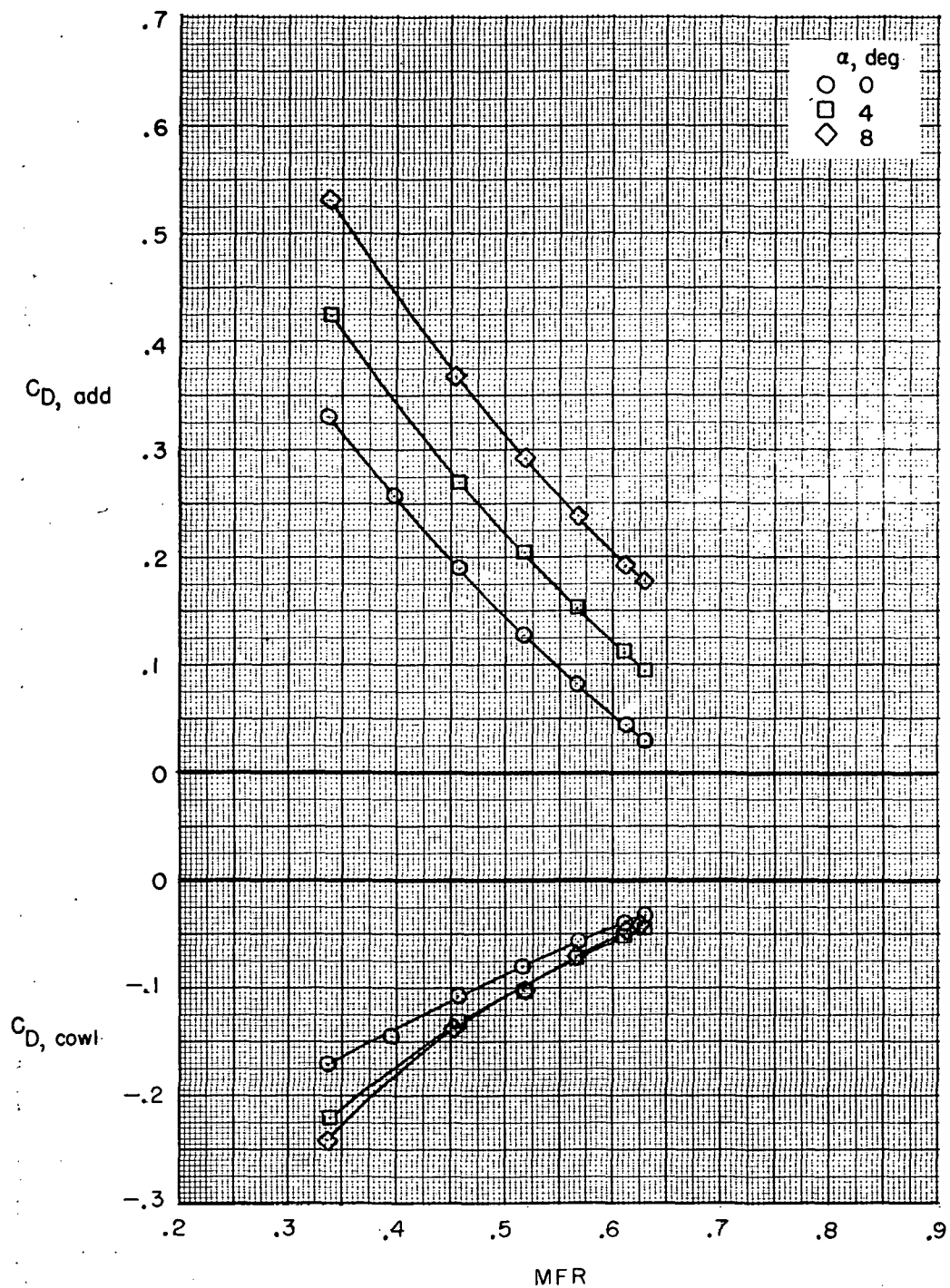
(c) $M = 0.8$.

Figure 14.- Concluded.



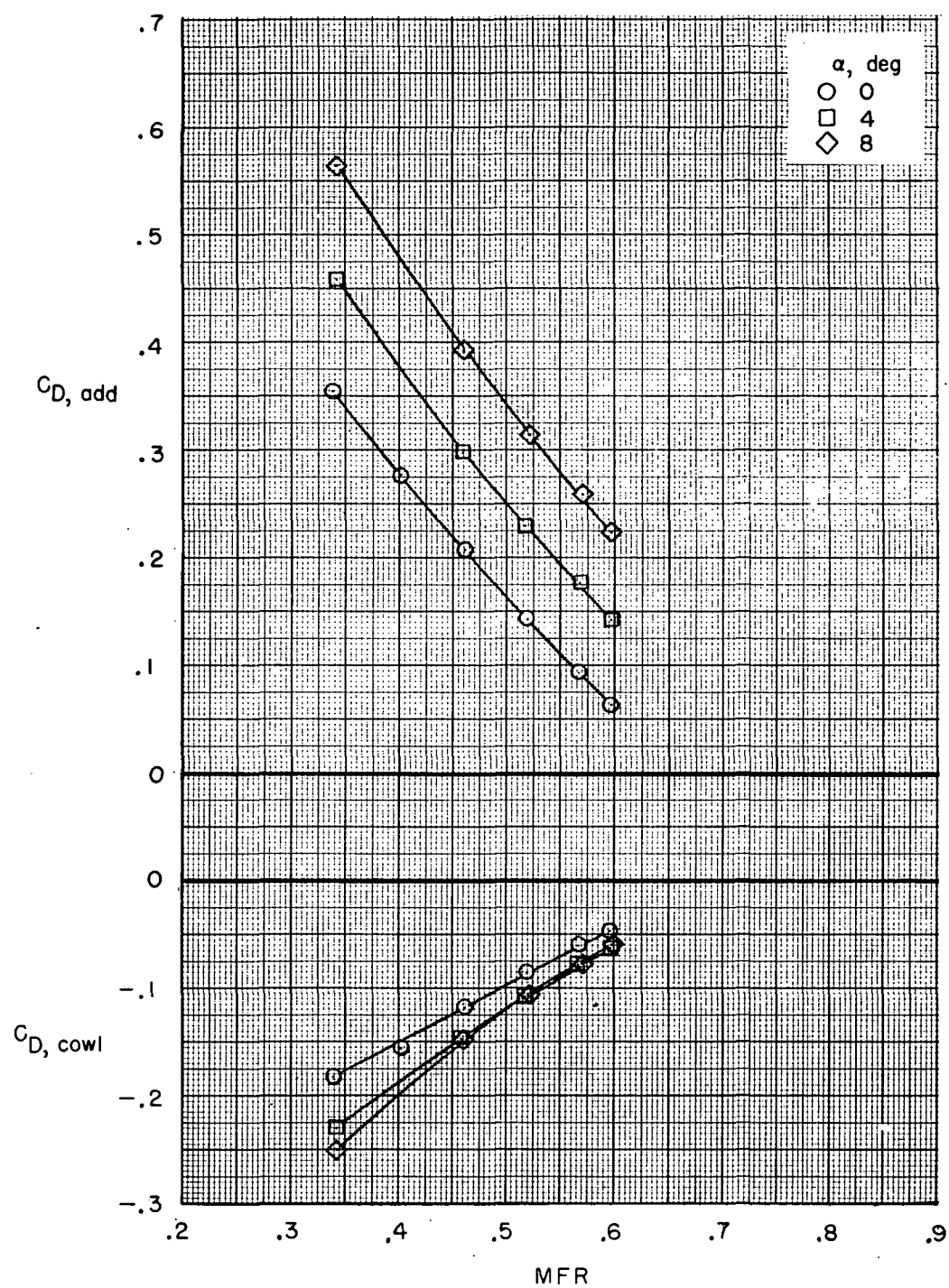
(a) $M = 0.6$.

Figure 15.- Additive and cowl drag characteristics. Cowl 45-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



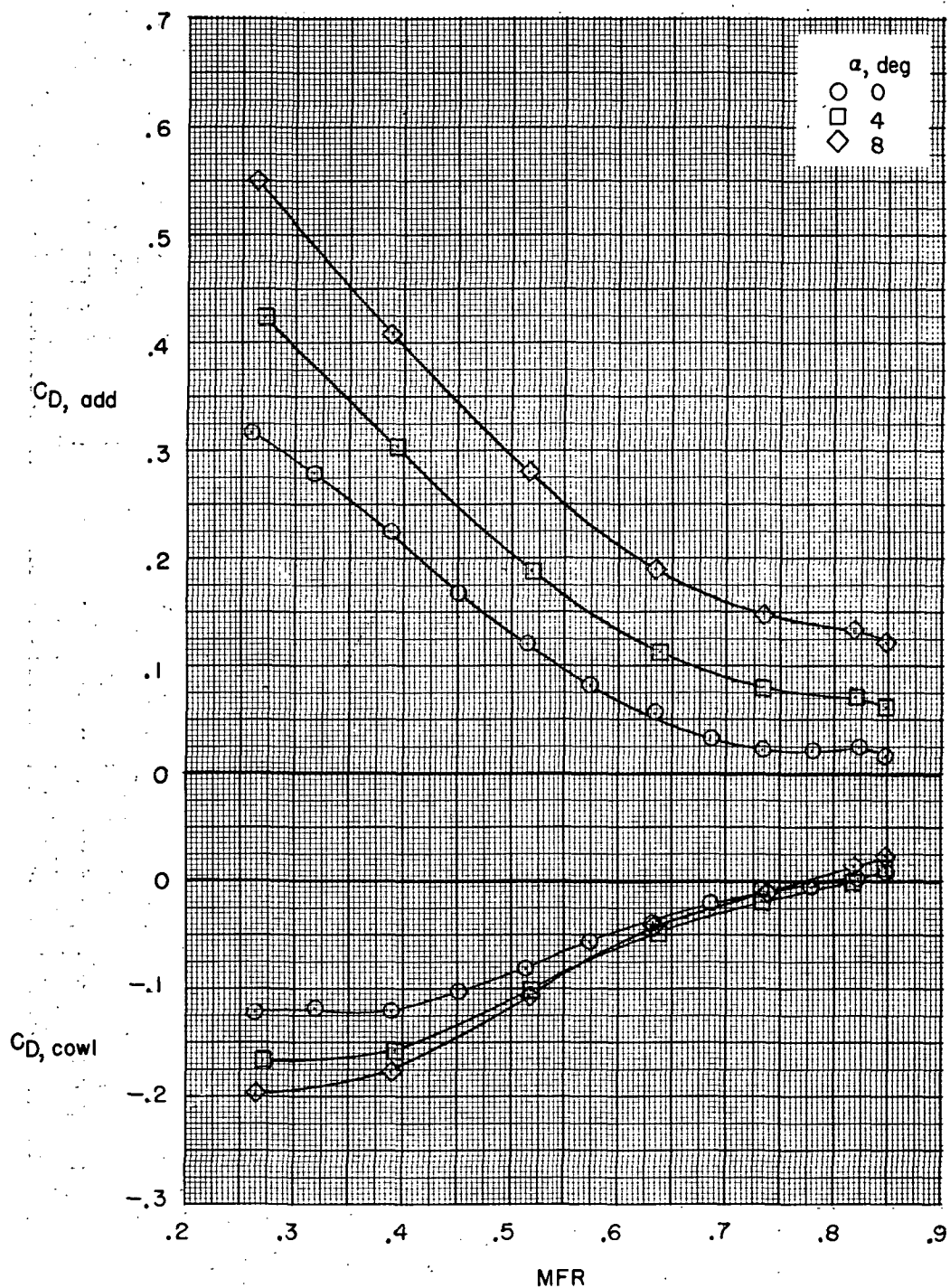
(b) $M = 0.7$.

Figure 15.- Continued.



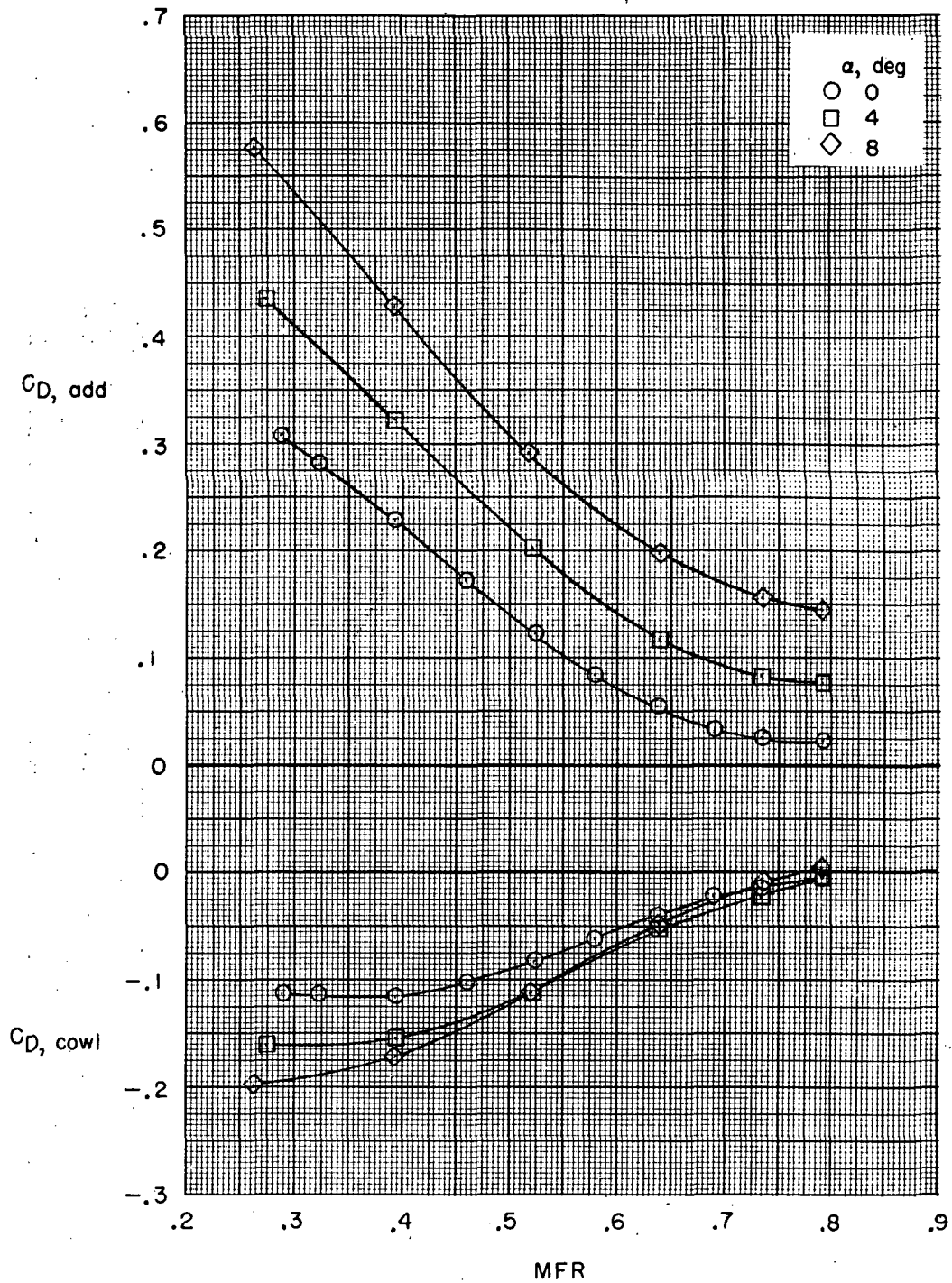
(c) $M = 0.8$.

Figure 15.- Concluded.



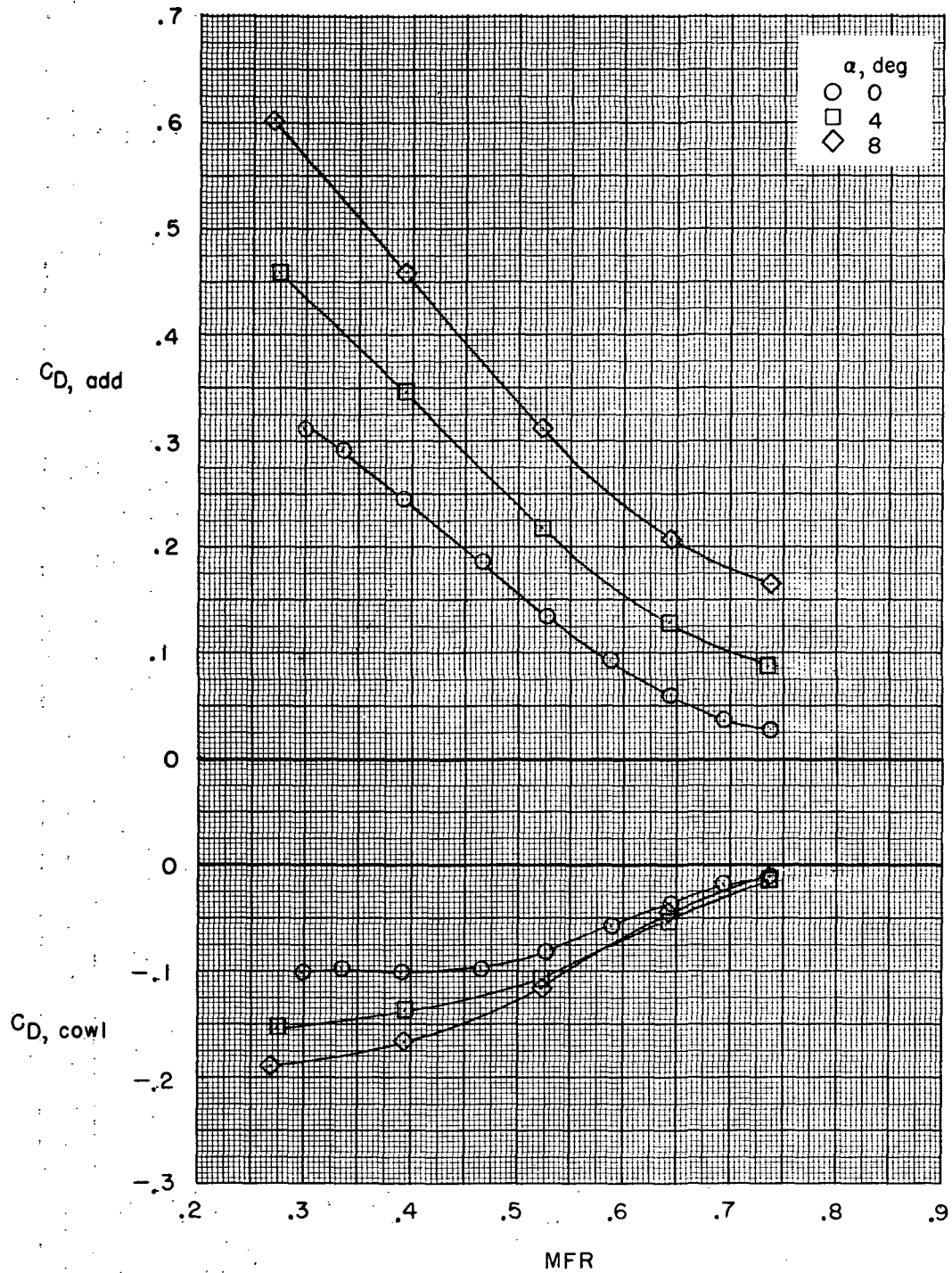
(a) $M = 0.6$.

Figure 16.- Additive and cowl drag characteristics. Cowl 20-2; $\delta_1 = \delta_2 = 5^\circ$.



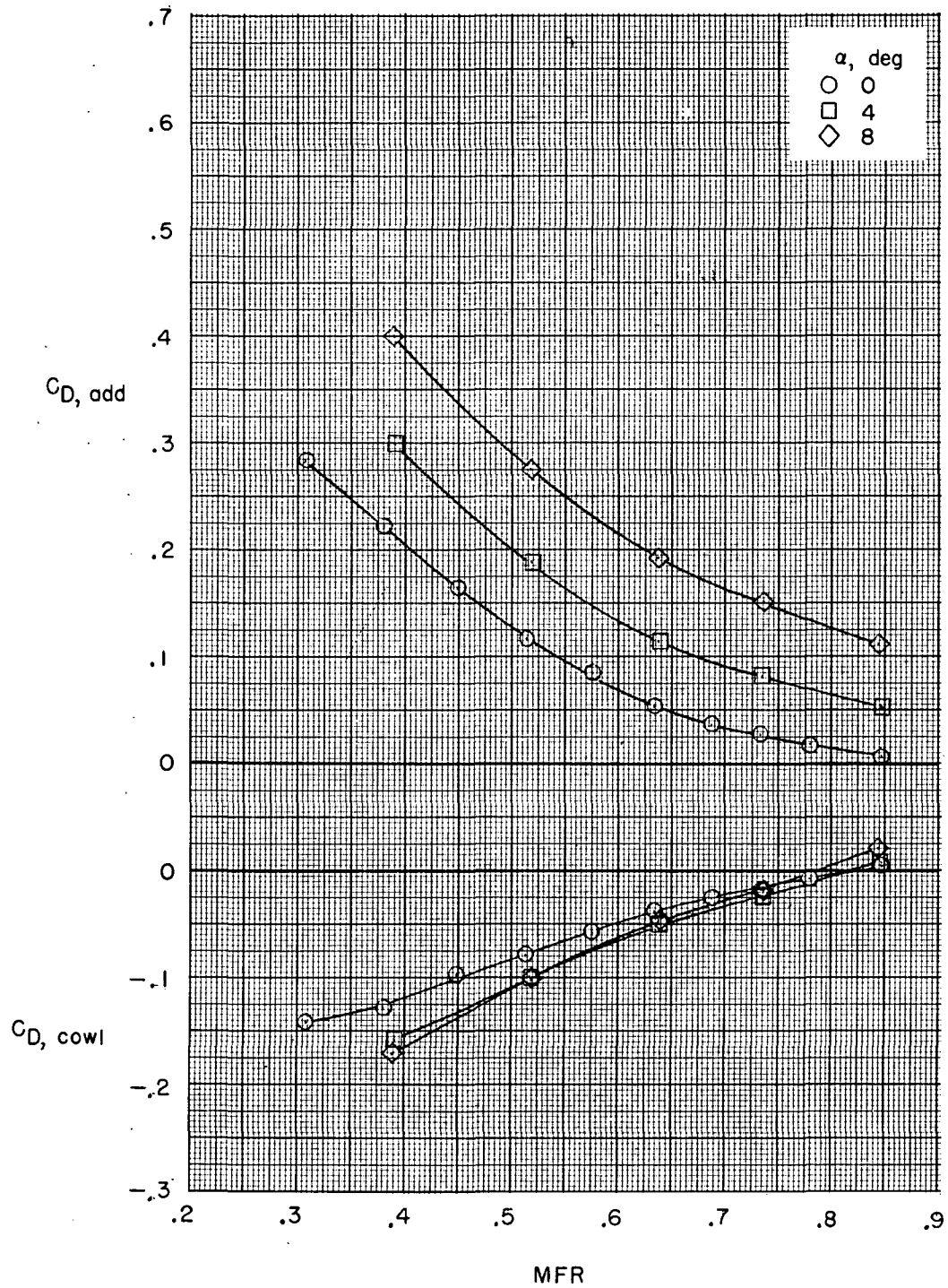
(b) $M = 0.7$.

Figure 16.- Continued.



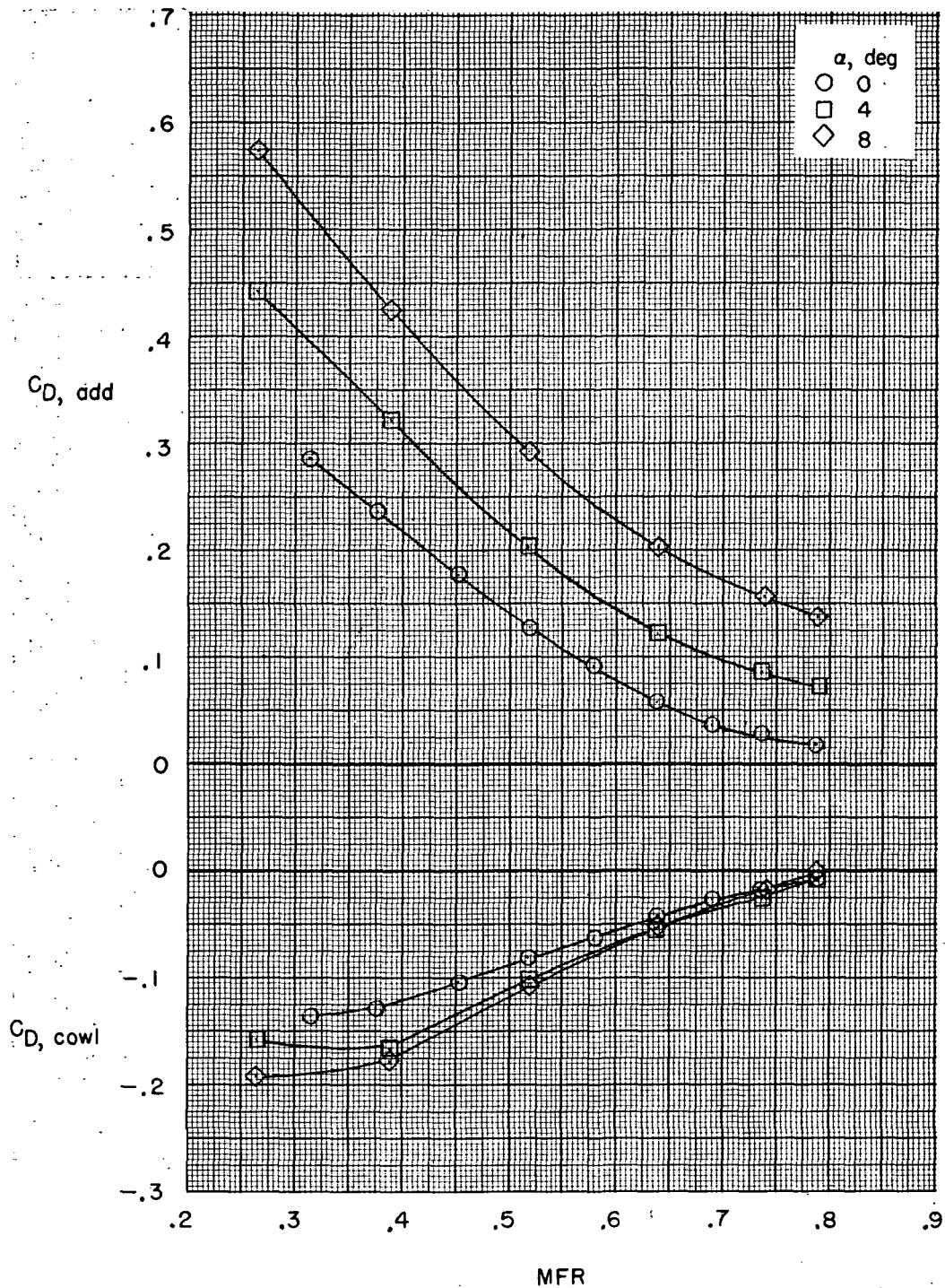
(c) $M = 0.8$.

Figure 16.- Concluded.



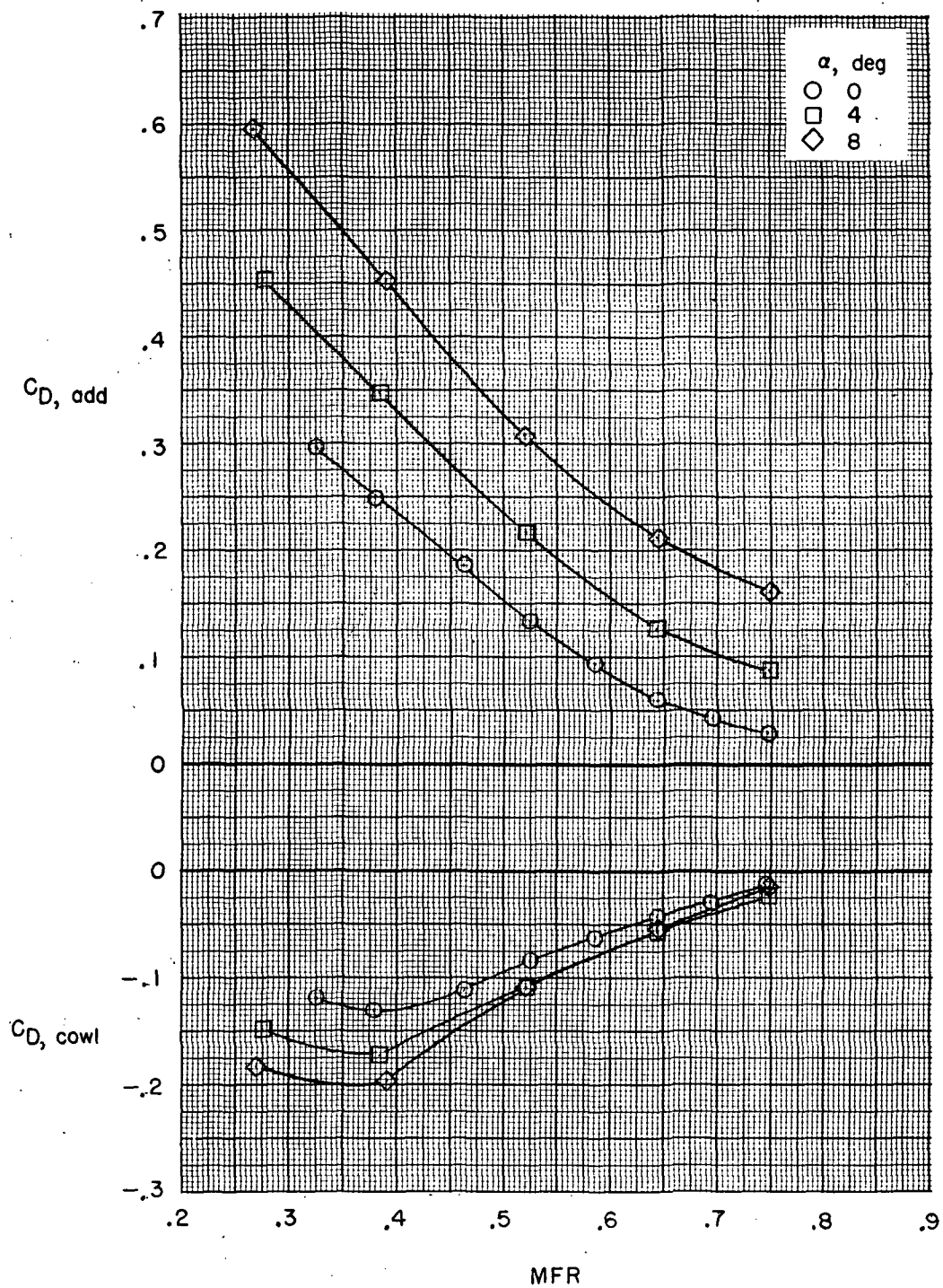
(a) $M = 0.6$.

Figure 17.- Additive and cowl drag characteristics. Cowl 35-2; $\delta_1 = \delta_2 = 5^\circ$.



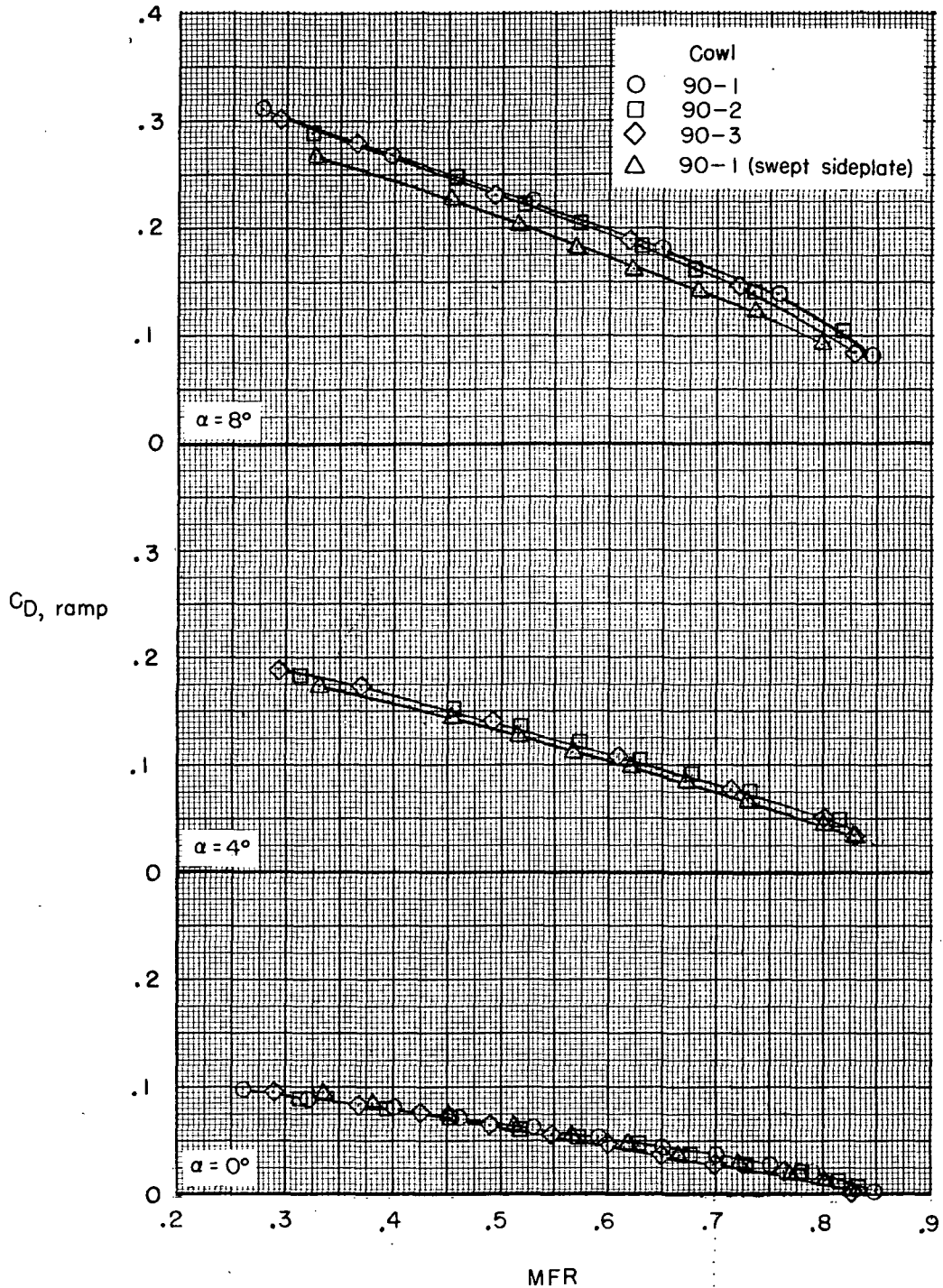
(b) $M = 0.7$.

Figure 17.- Continued.



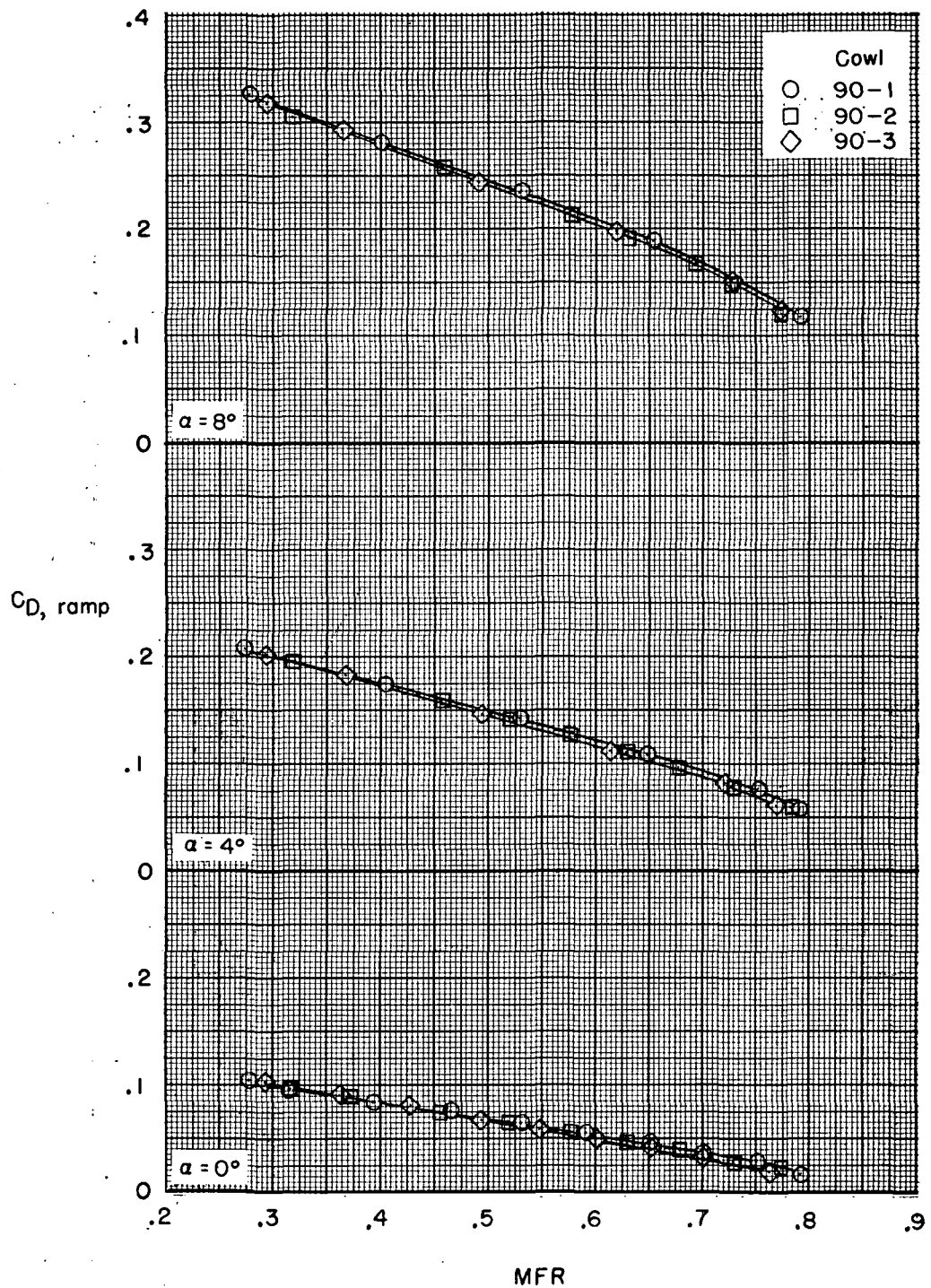
(c) $M = 0.8$.

Figure 17.- Concluded.



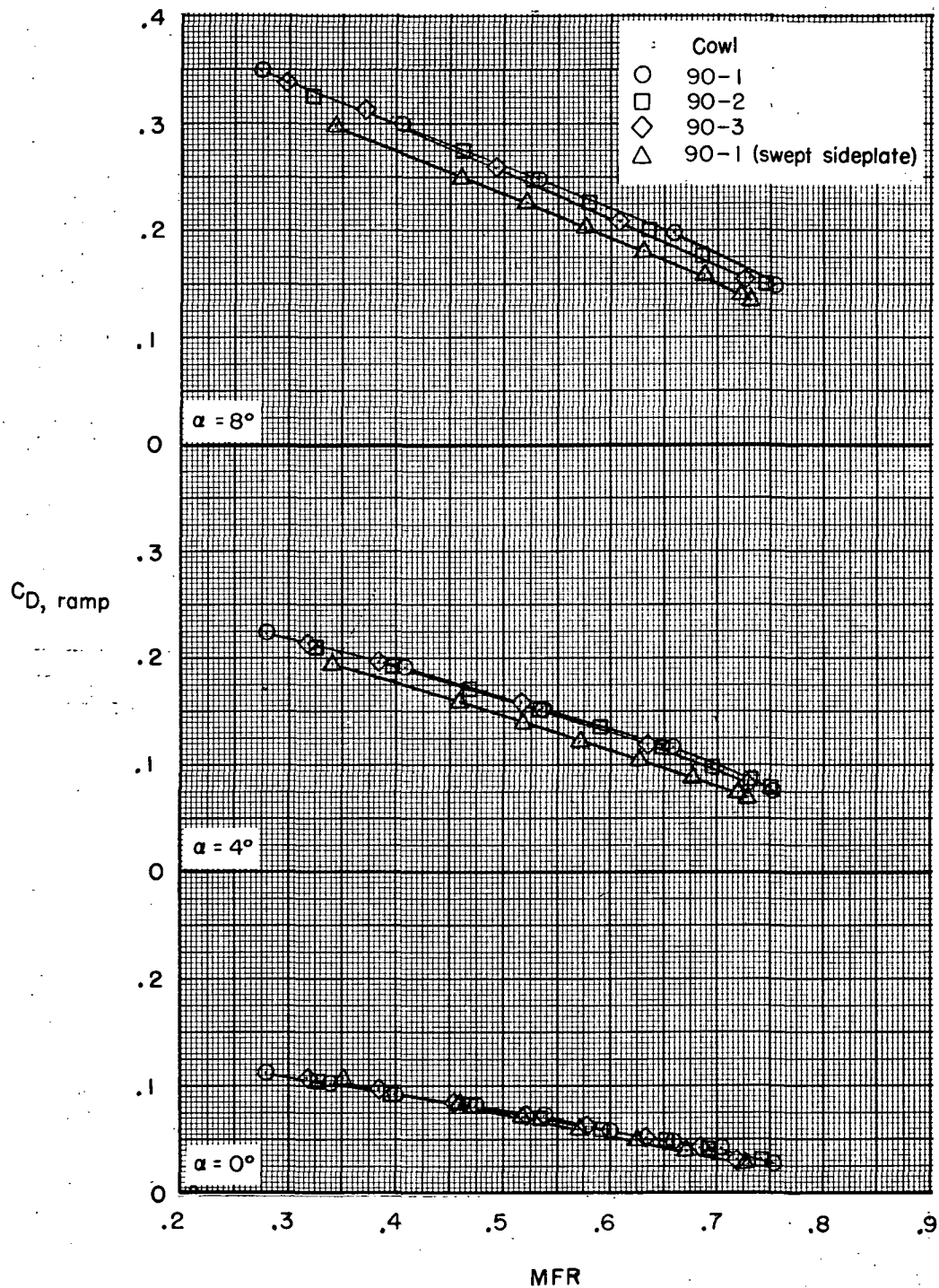
(a) $M = 0.6$.

Figure 18.- Ramp drag characteristics. Cowls 90-1, -2, -3, 90-1 with swept sideplate; $\delta_1 = \delta_2 = 5^\circ$.



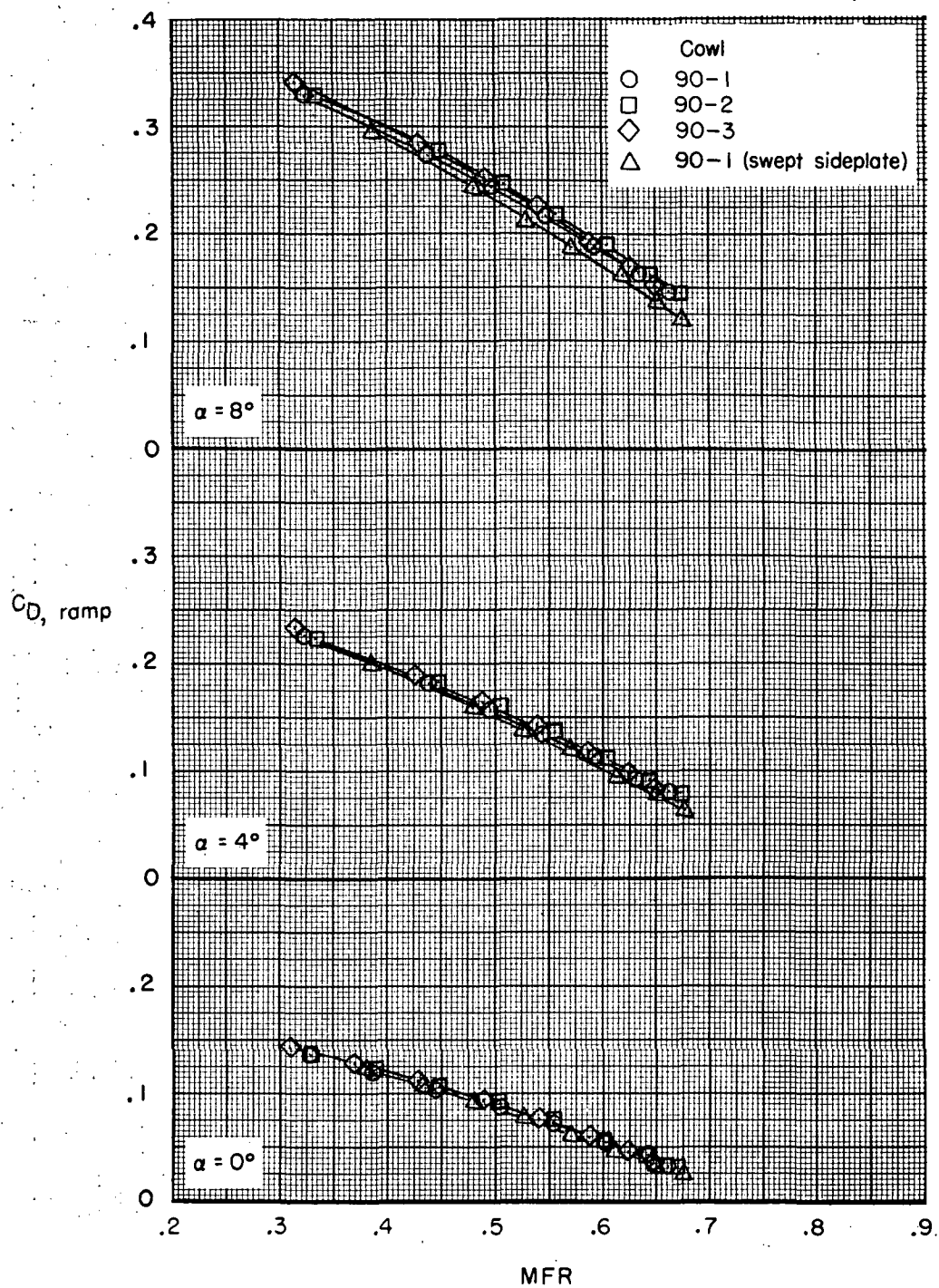
(b) $M = 0.7$.

Figure 18.- Continued.



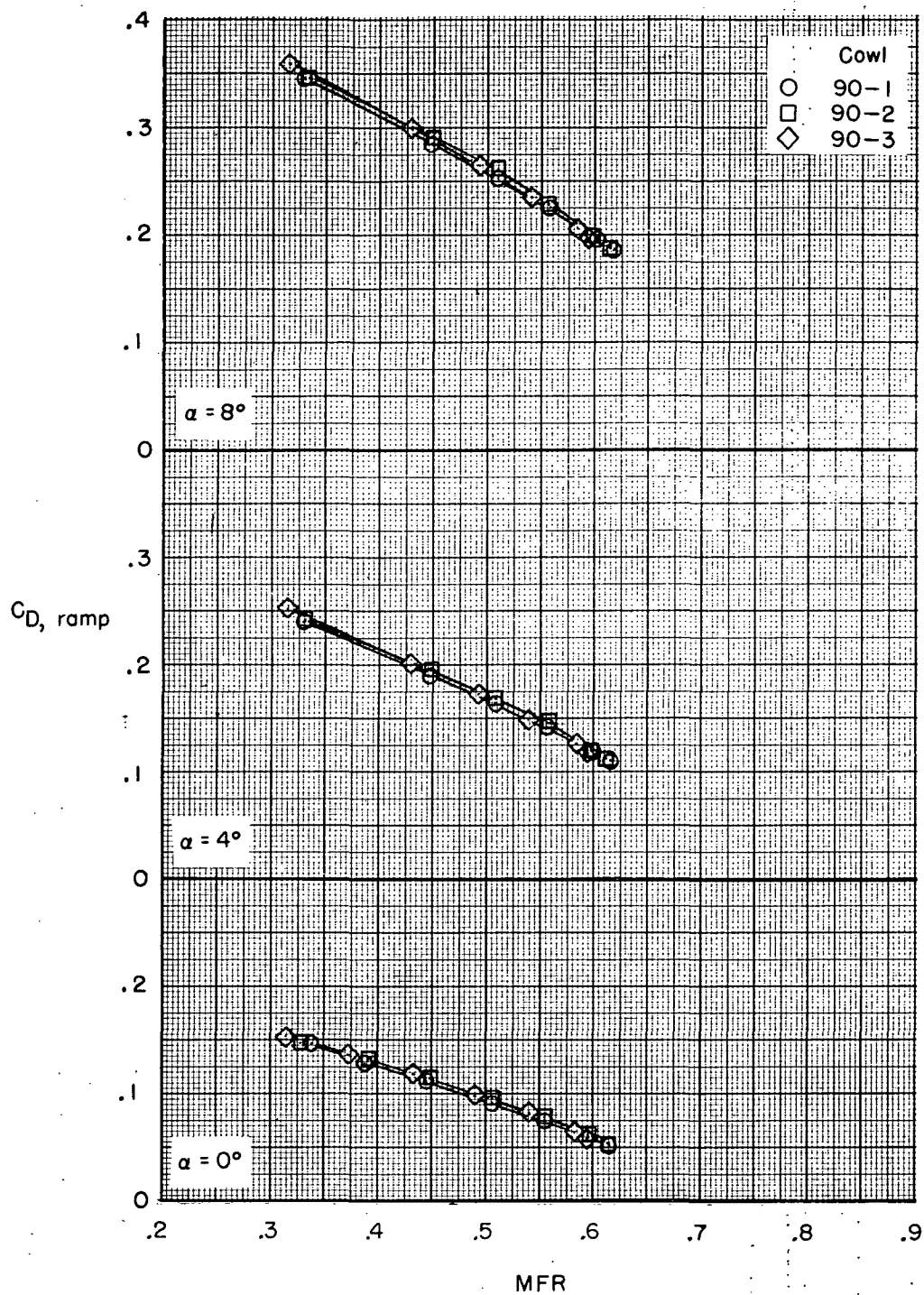
(c) $M = 0.8$.

Figure 18.- Concluded.



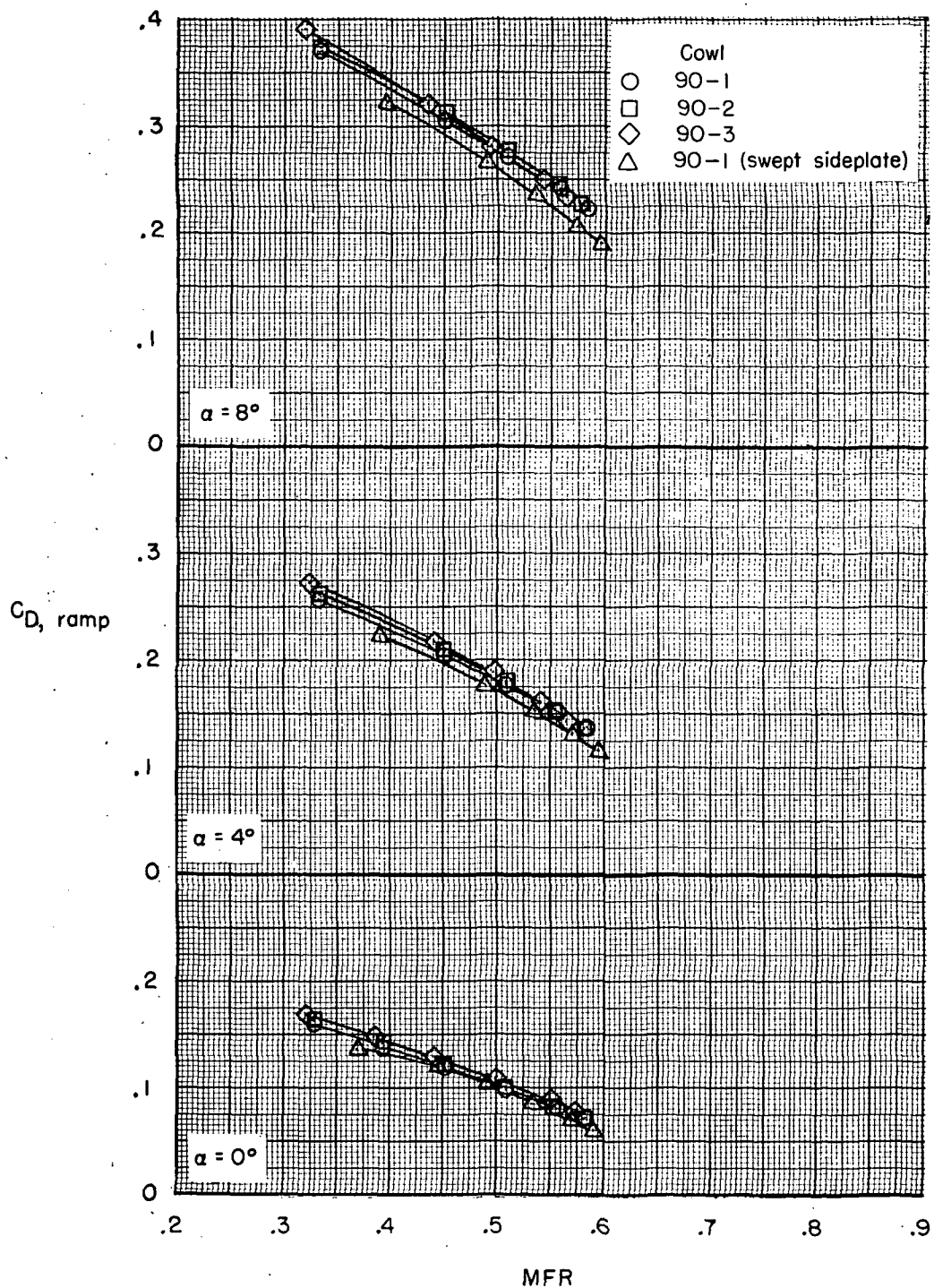
(a) $M = 0.6$.

Figure 19.- Ramp drag characteristics. Cowls 90-1, -2, -3, 90-1 with swept sideplate; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



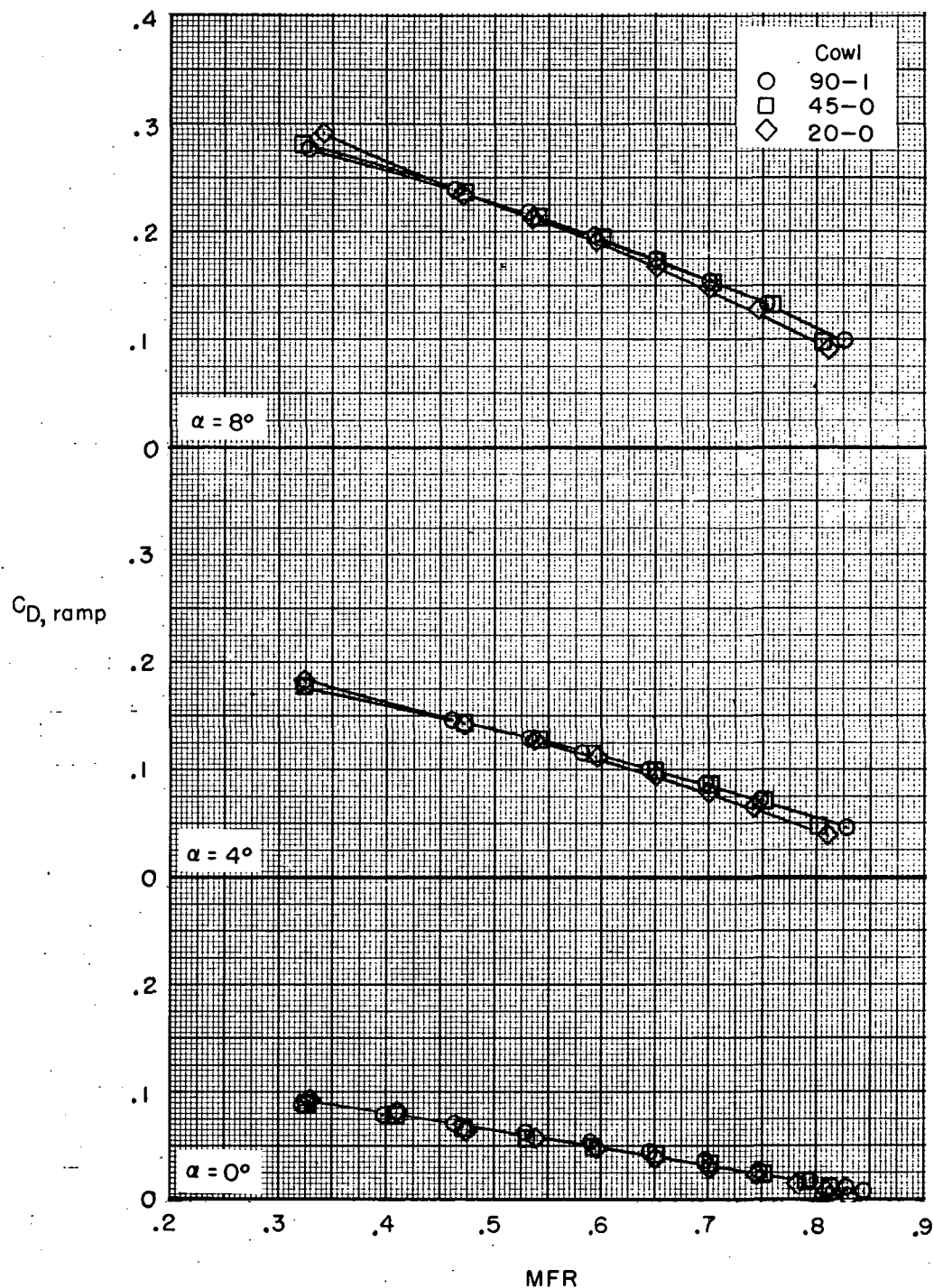
(b) $M = 0.7$.

Figure 19.- Continued.



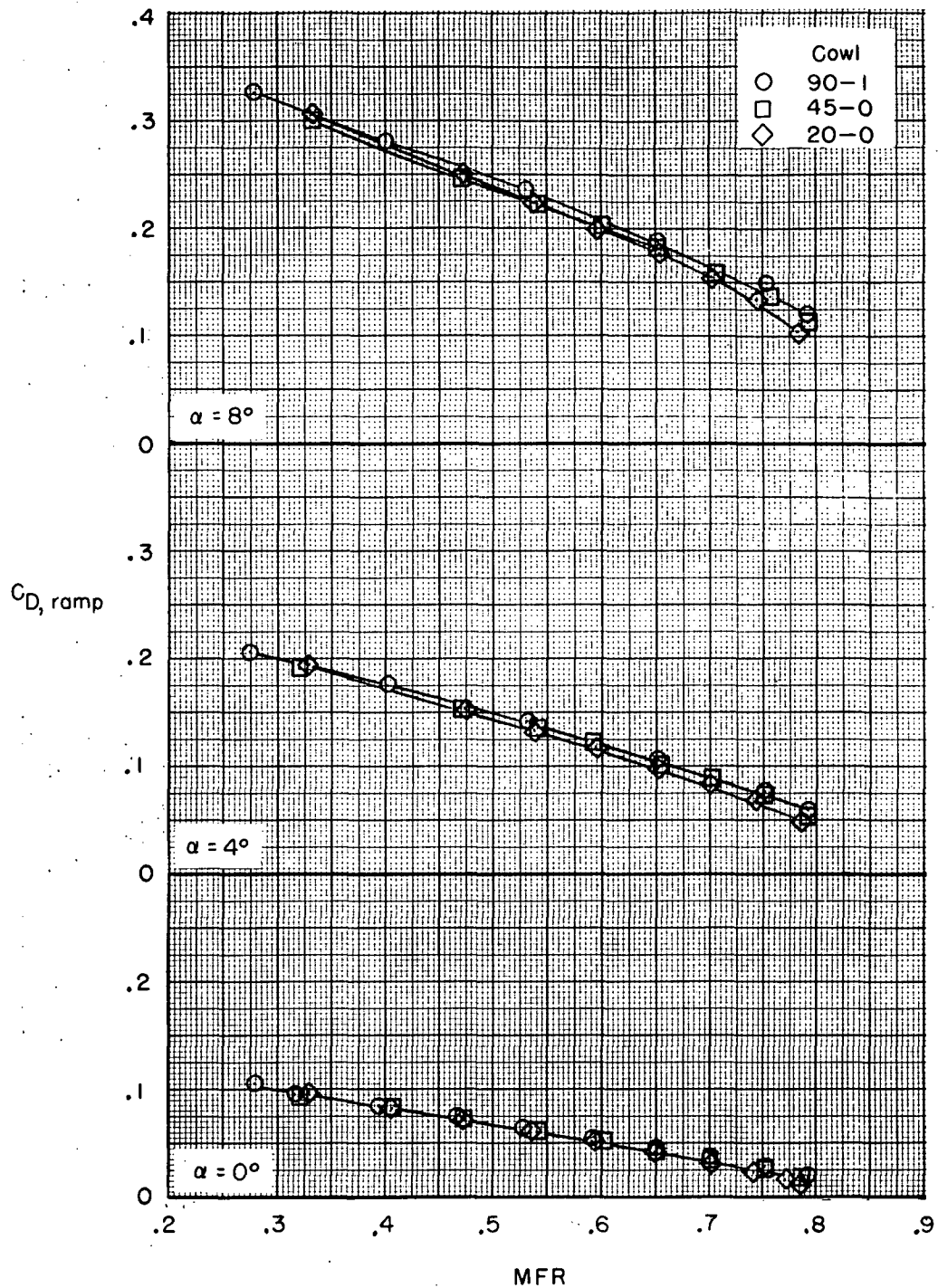
(c) $M = 0.8$.

Figure 19.- Concluded.



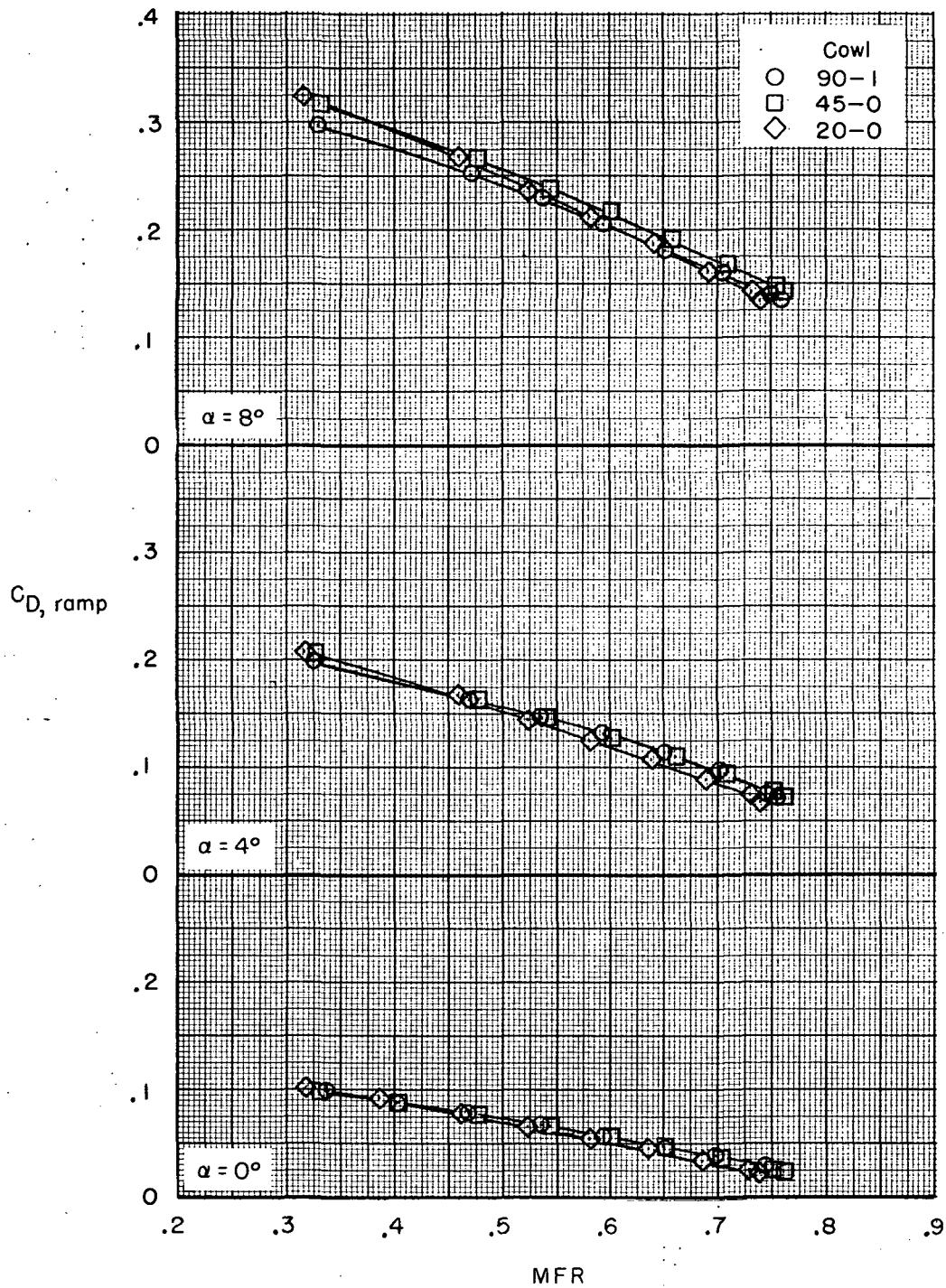
(a) $M = 0.6$.

Figure 20.- Ramp drag characteristics. Cowls 90-1, 45-0, 20-0; $\delta_1 = \delta_2 = 5^\circ$.



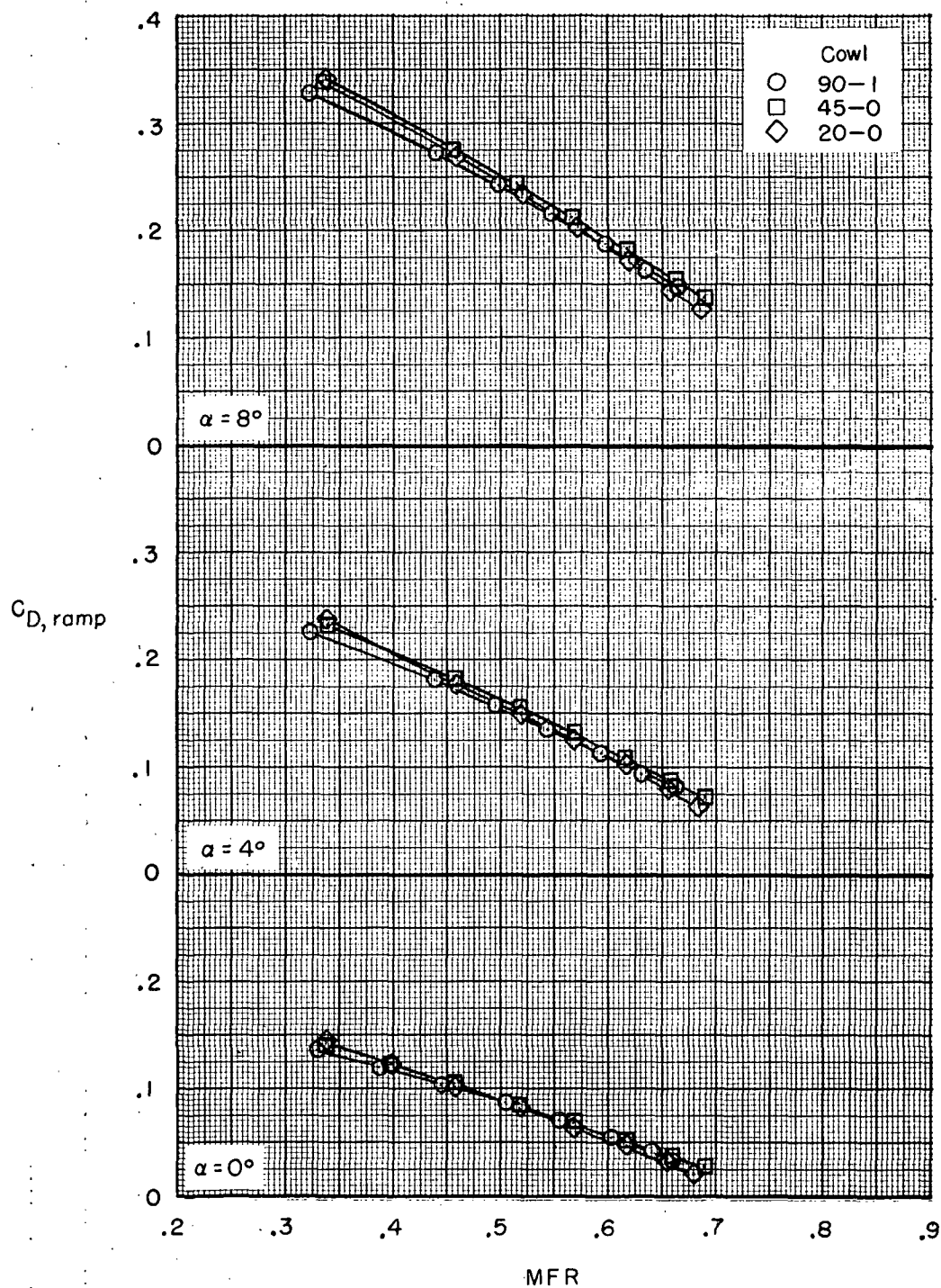
(b) $M = 0.7$.

Figure 20.- Continued.



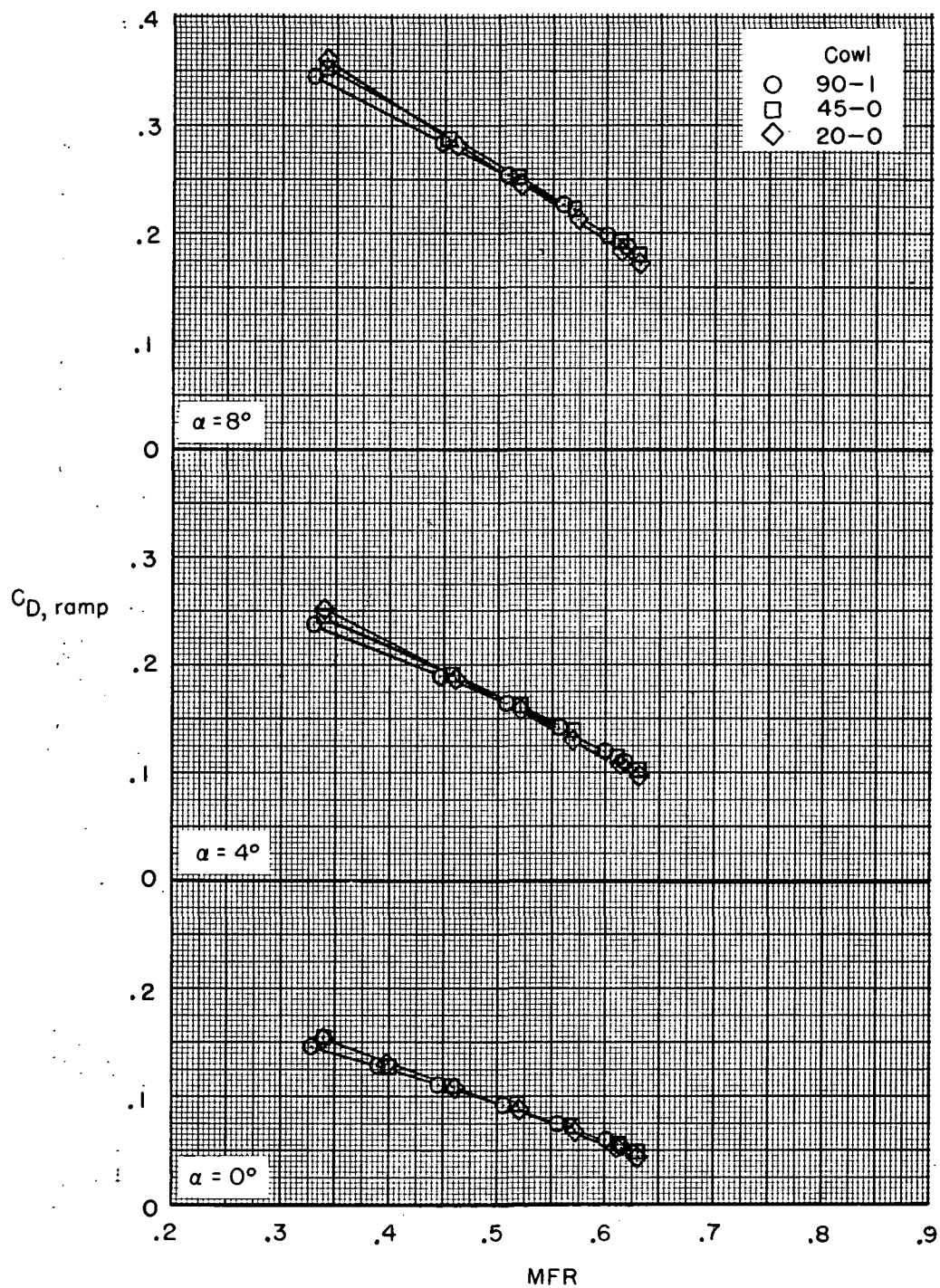
(c) $M = 0.8$.

Figure 20.- Concluded.



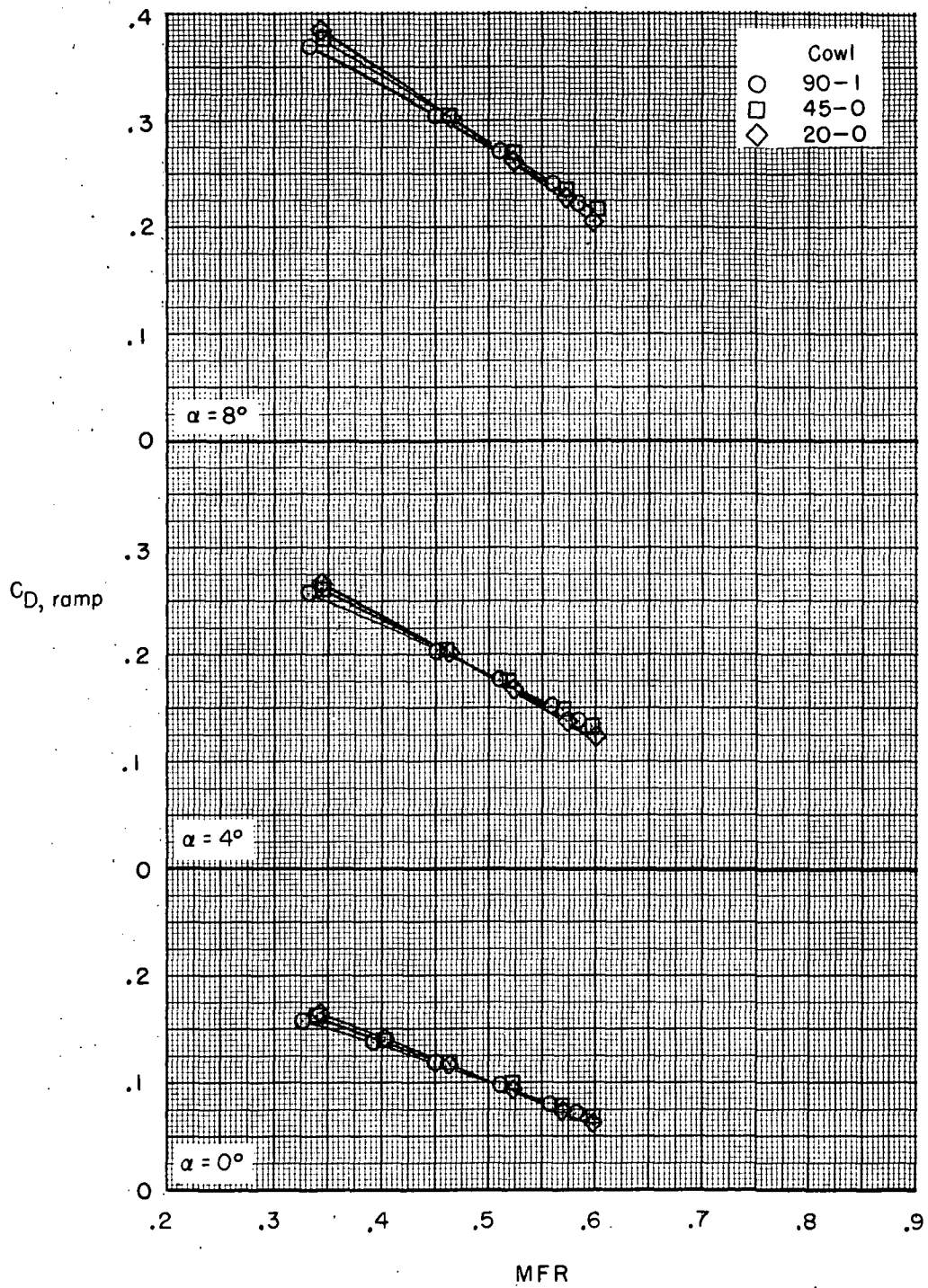
(a) $M = 0.6$.

Figure 21.- Ramp drag characteristics. Cowls 90-1, 45-0, 20-0; $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



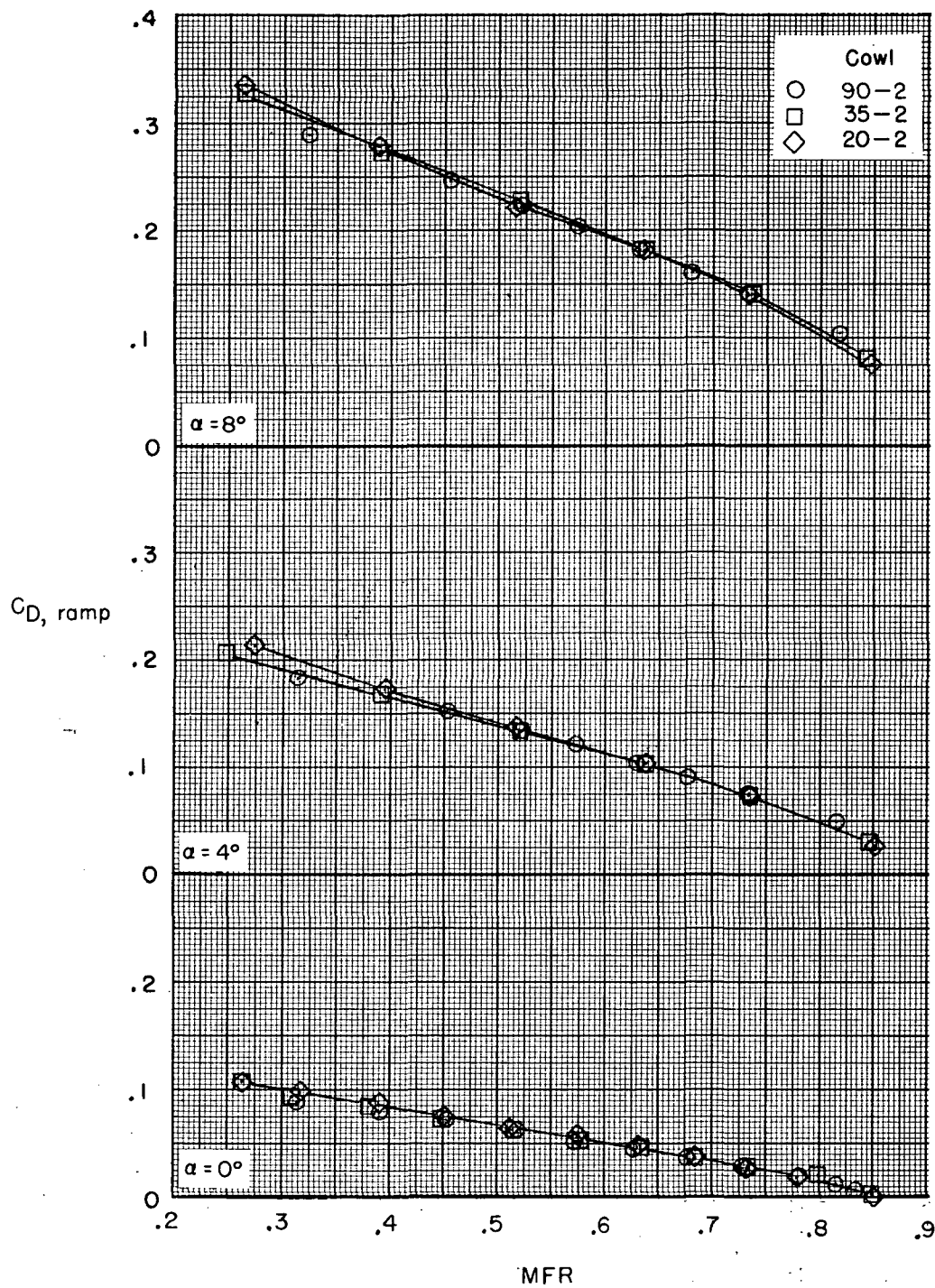
(b) $M = 0.7$.

Figure 21.- Continued.



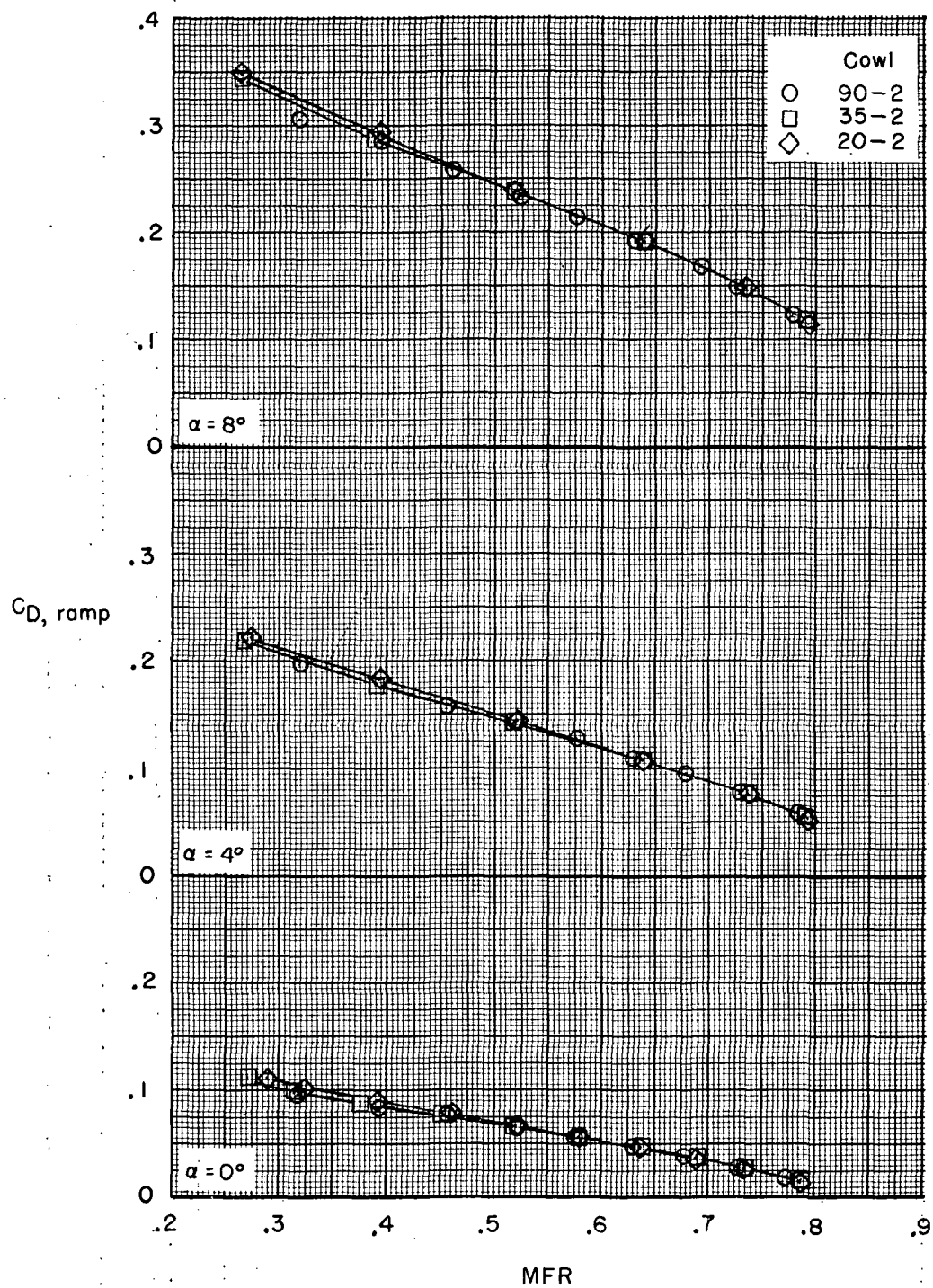
(c) $M = 0.8$.

Figure 21.- Concluded.



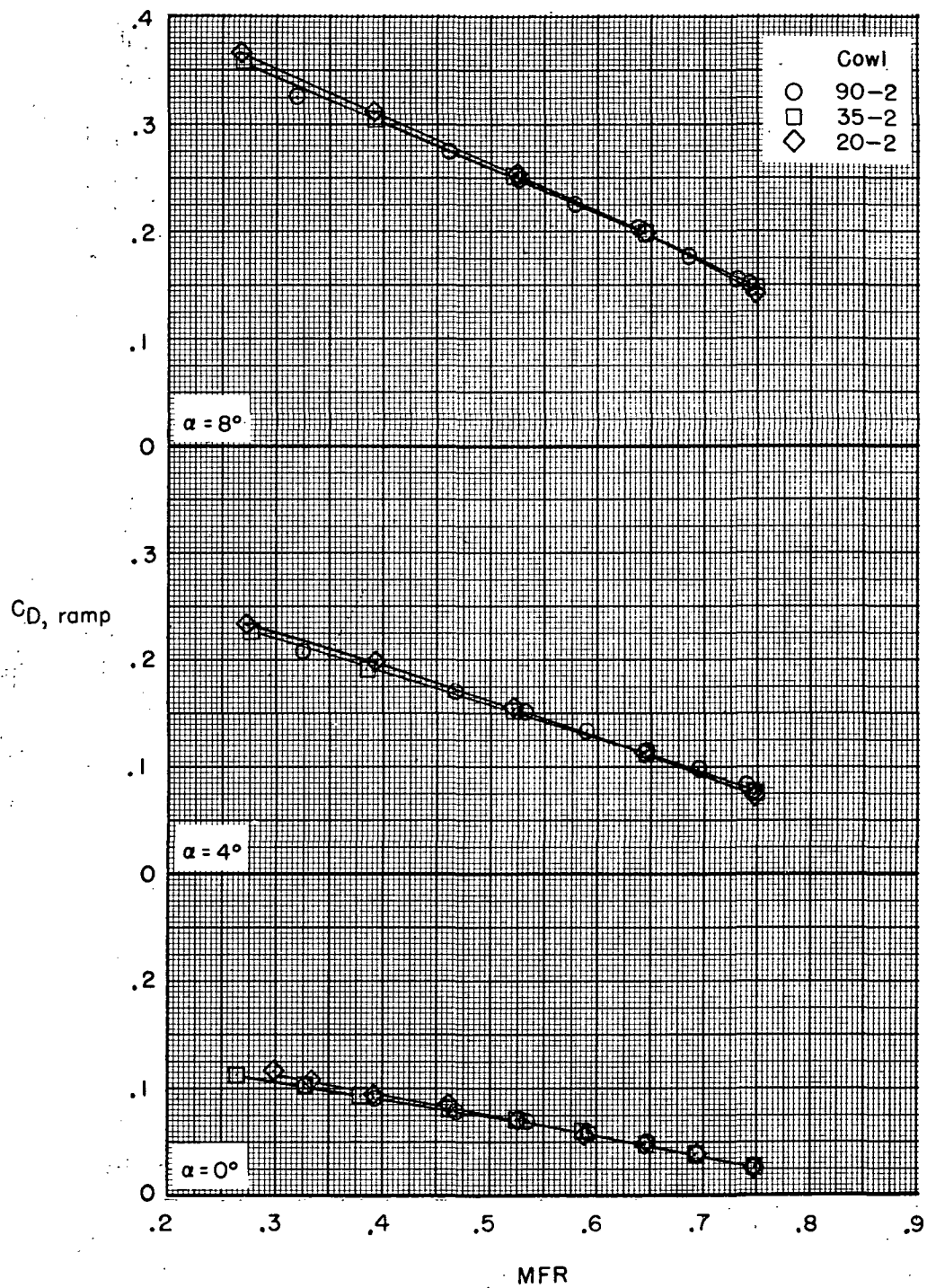
(a) $M = 0.6$.

Figure 22.- Ramp drag characteristics. Cowls 90-2, 35-2, 20-2; $\delta_1 = \delta_2 = 5^\circ$.



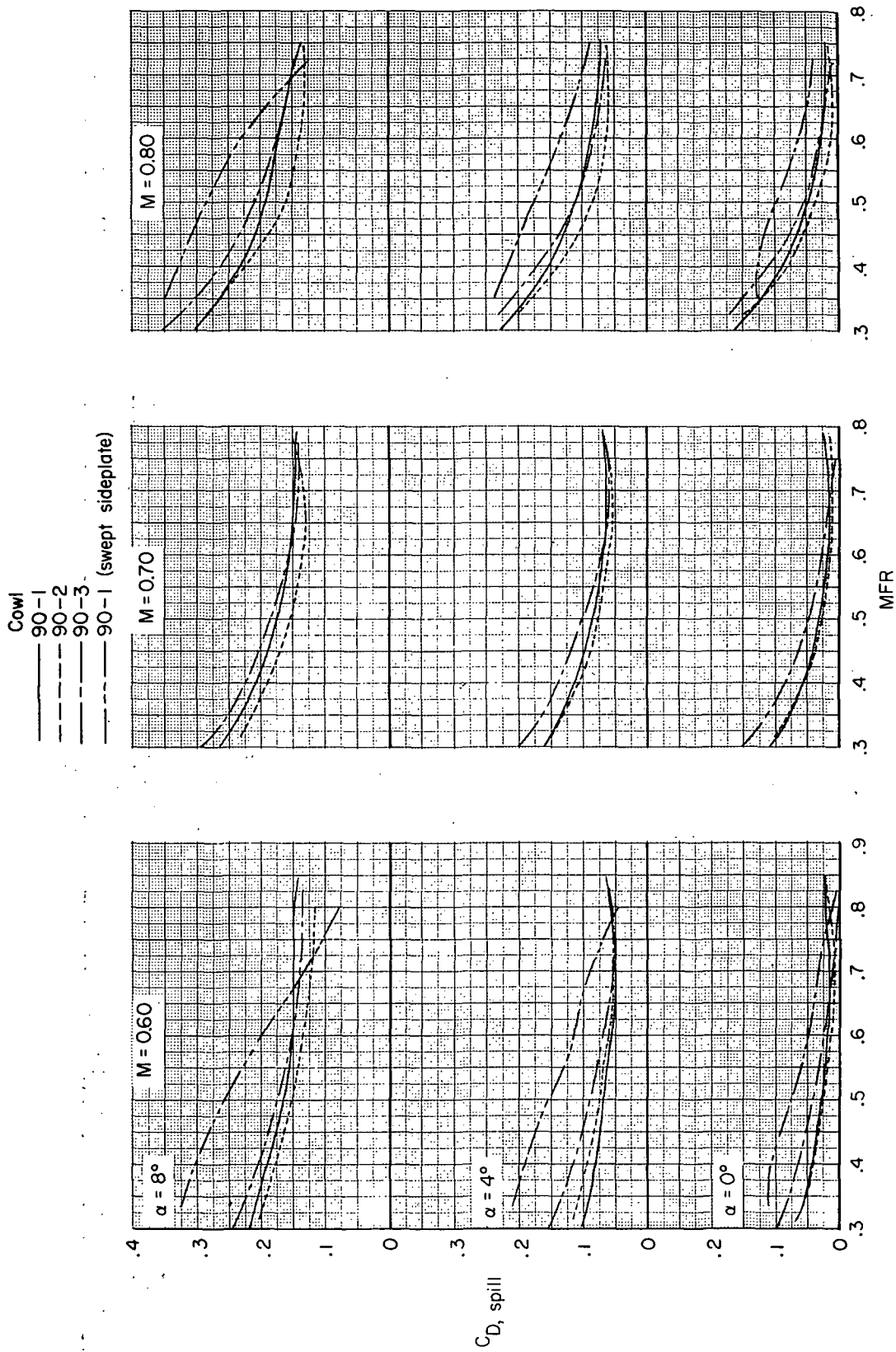
(b) $M = 0.7$.

Figure 22.- Continued.



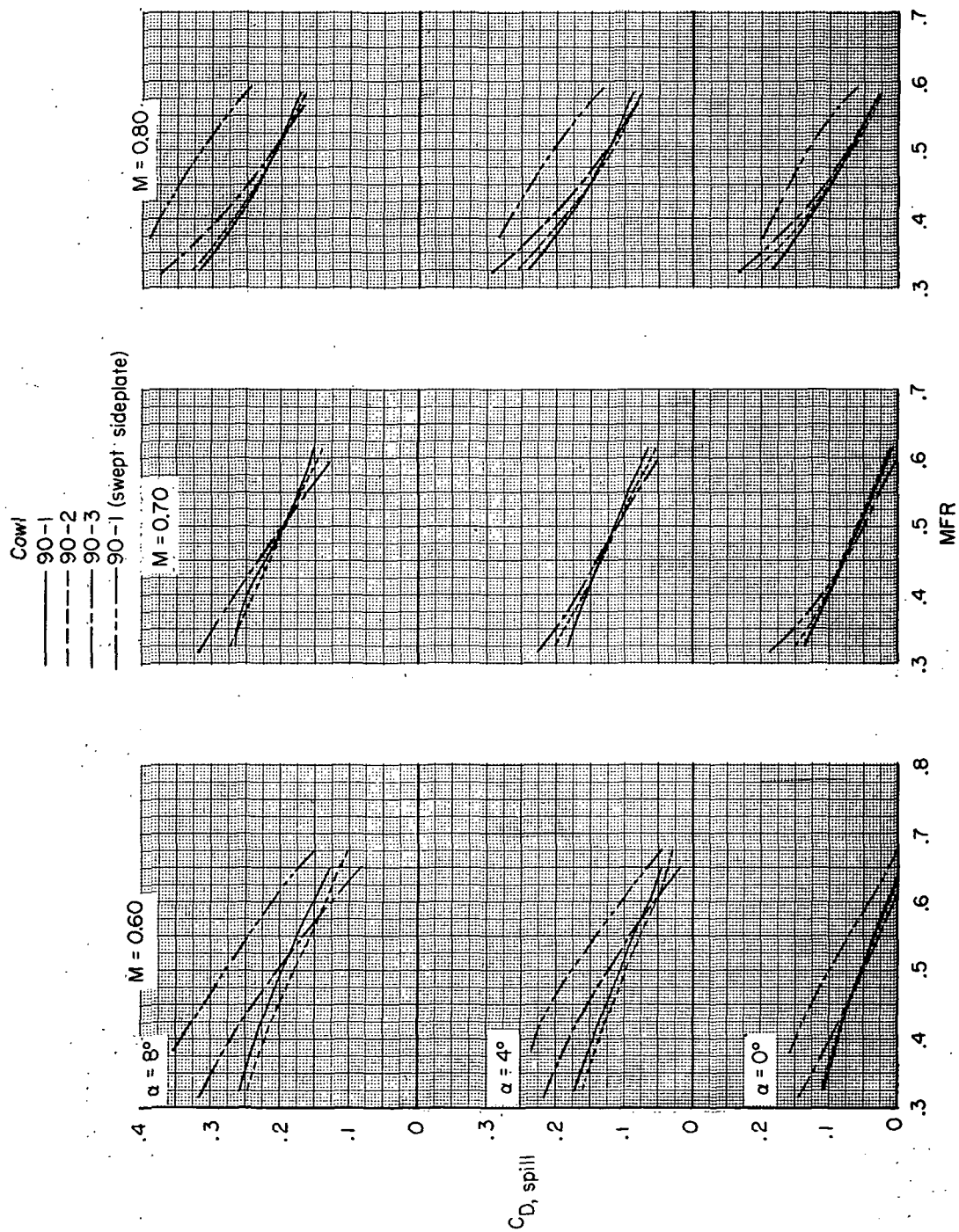
(c) $M = 0.8$.

Figure 22.- Concluded.



(a) $\delta_1 = \delta_2 = 5^\circ$.

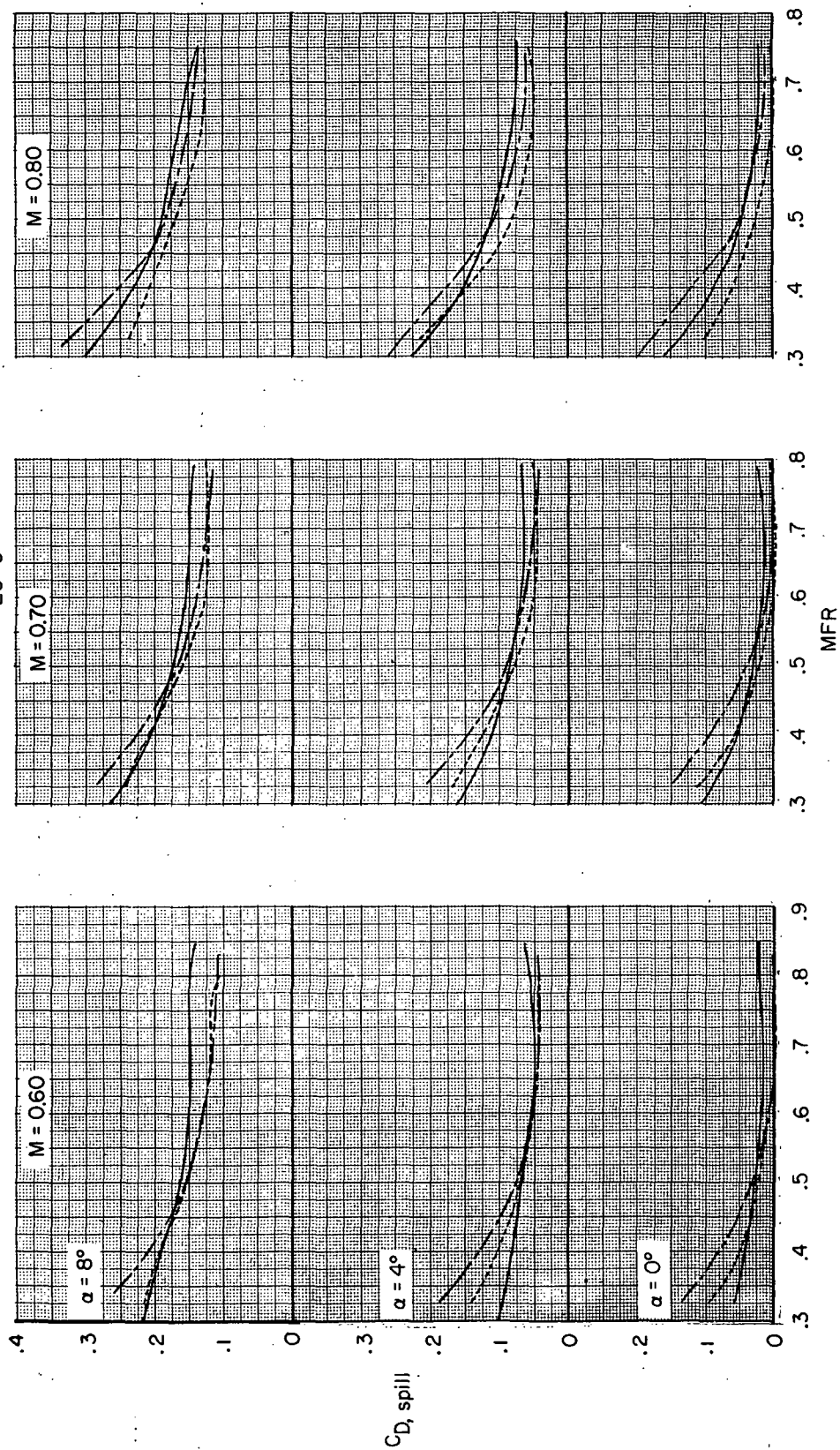
Figure 23.- Spillage drag characteristics.



(b) $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.

Figure 23.- Continued.

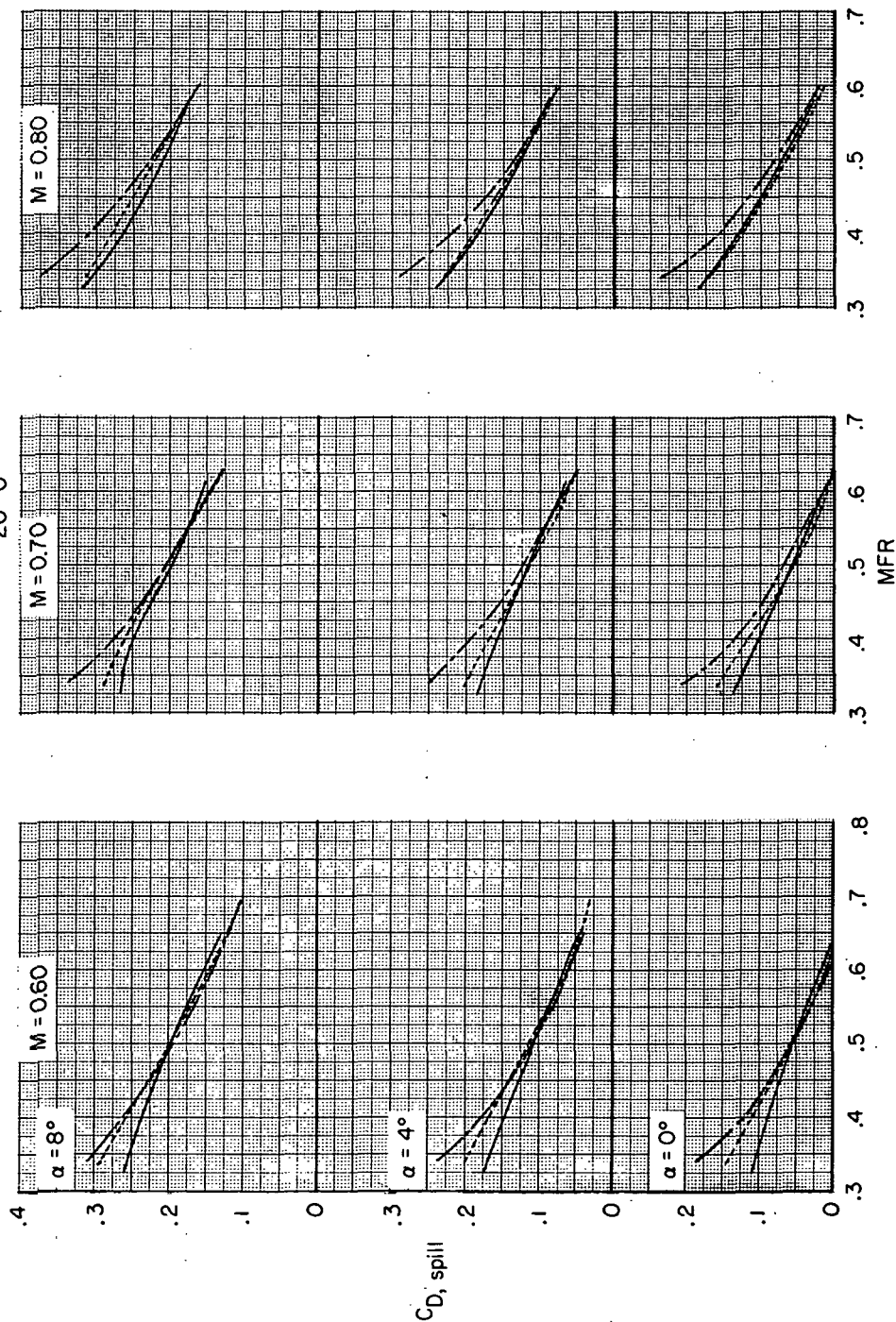
Cowl
 — 90-1
 - - - 45-0
 — 20-0



(c) $\delta_1 = \delta_2 = 5^\circ$.

Figure 23.- Continued.

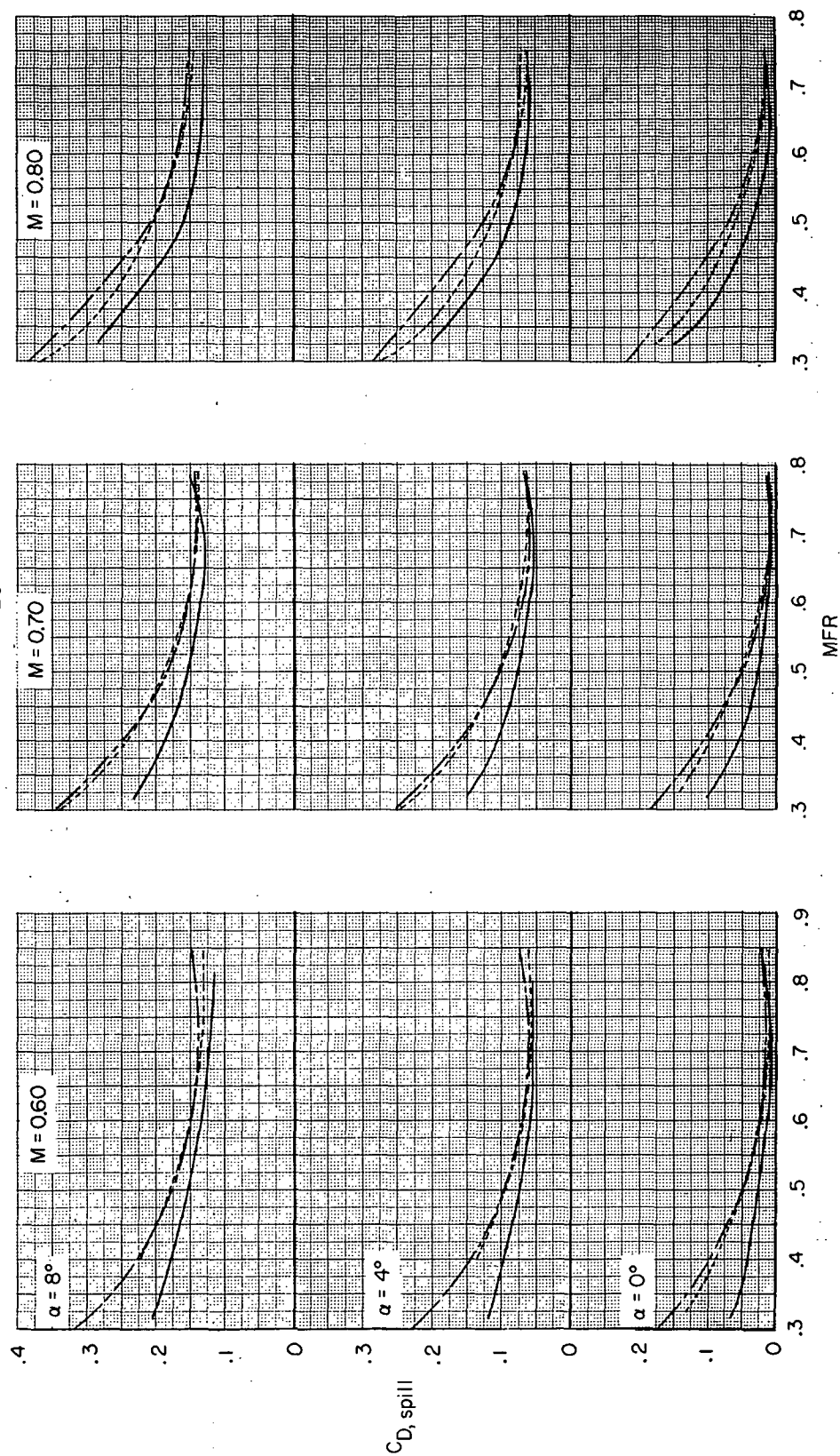
Cowl
 — 90-1
 - - - 45-0
 — 20-0



(d) $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.

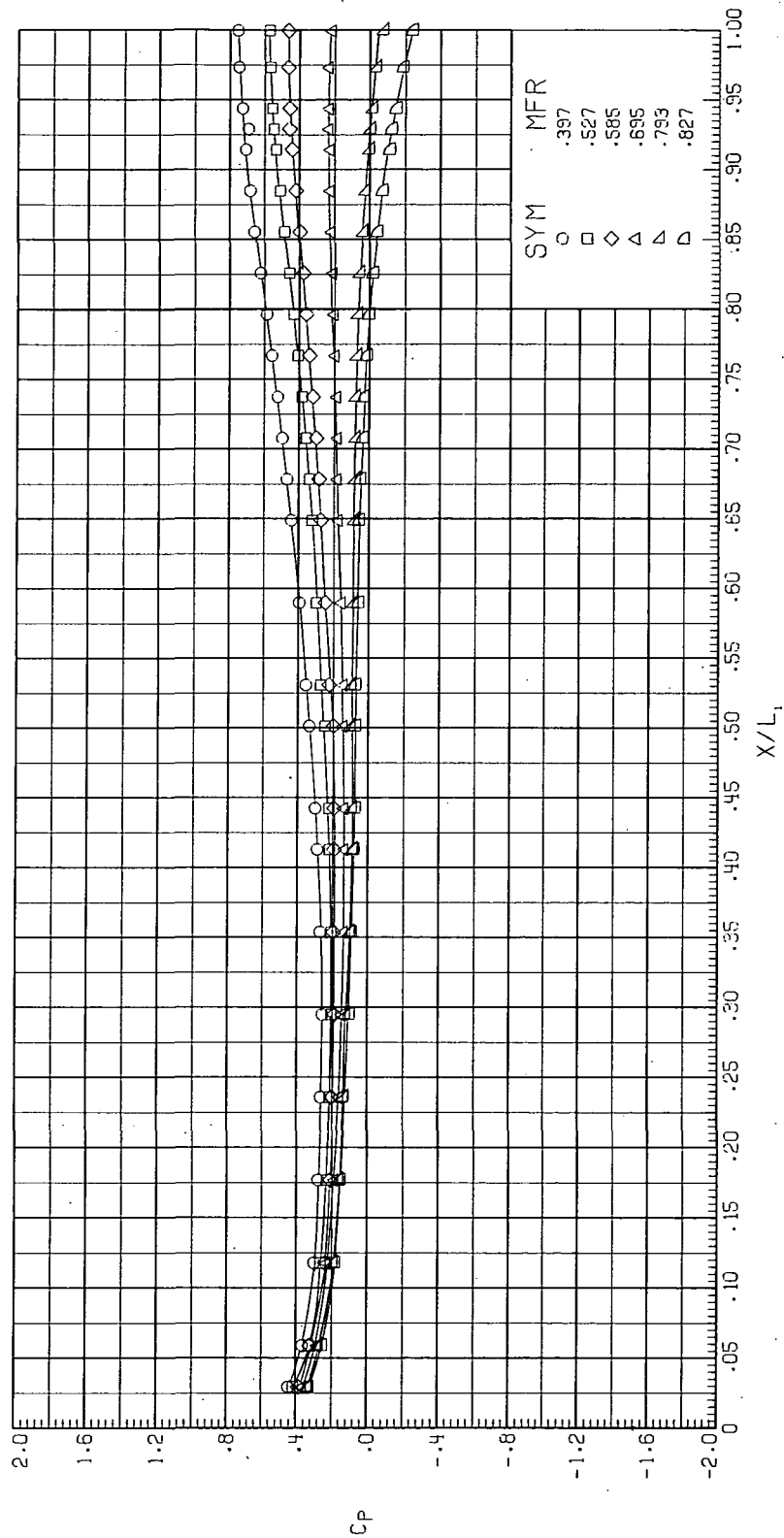
Figure 23.- Continued.

Cowl
 — 90-2
 - - 35-2
 - - 20-2



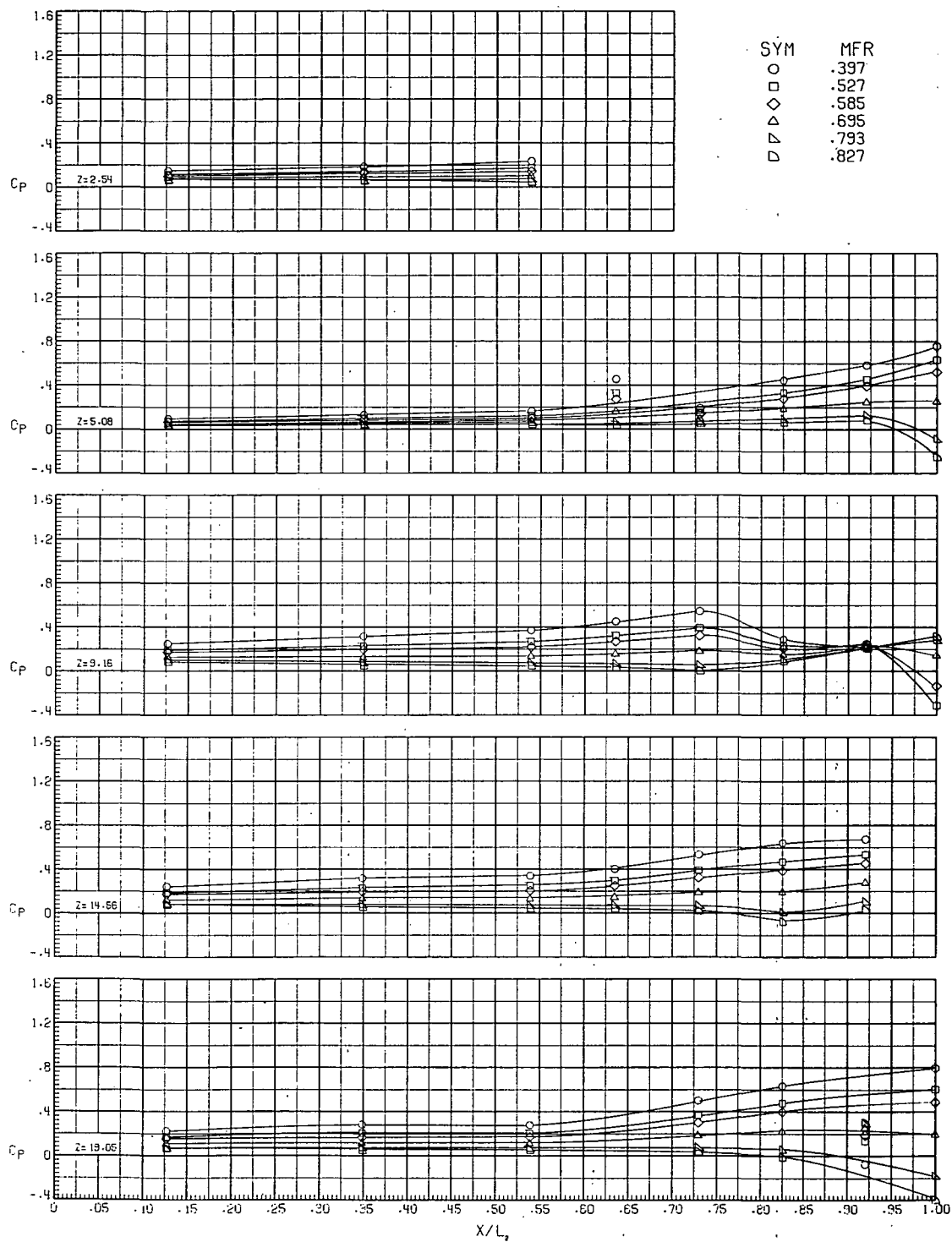
(e) $\delta_1 = \delta_2 = 5^\circ$.

Figure 23.- Concluded.



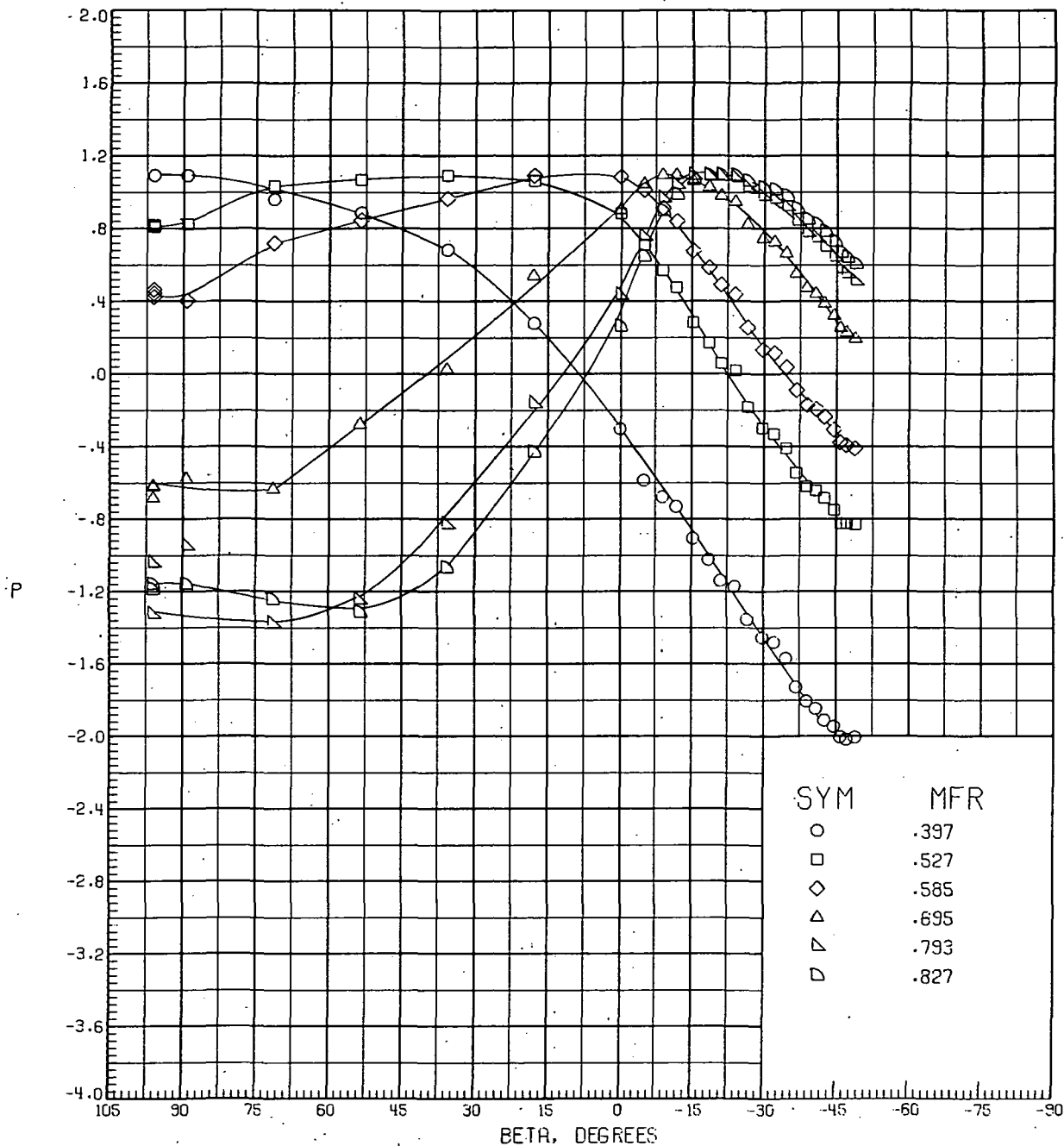
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 24.- Pressure coefficients for cowl 90-1. $\delta_1 = \delta_2 = 5^\circ$.



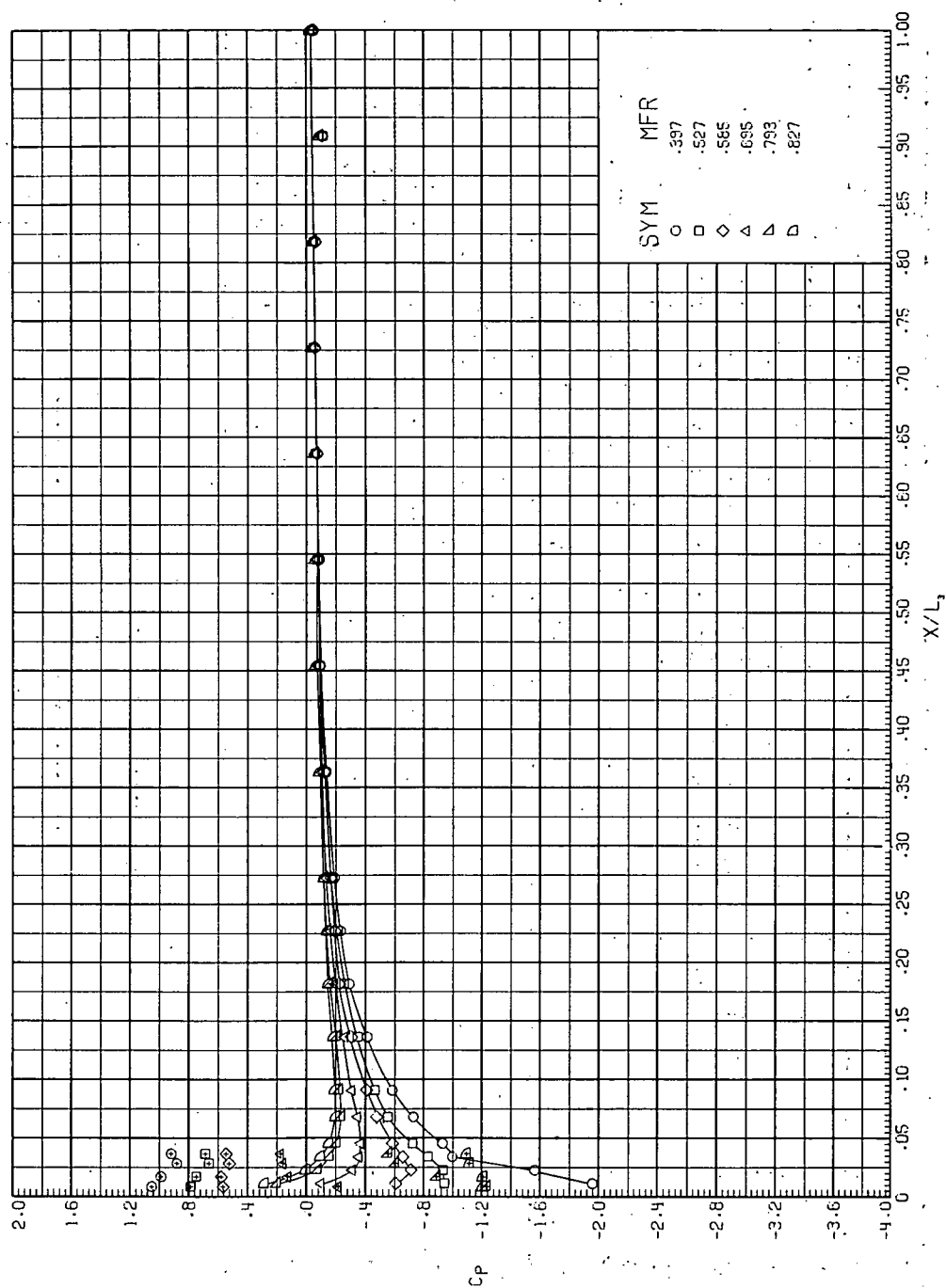
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



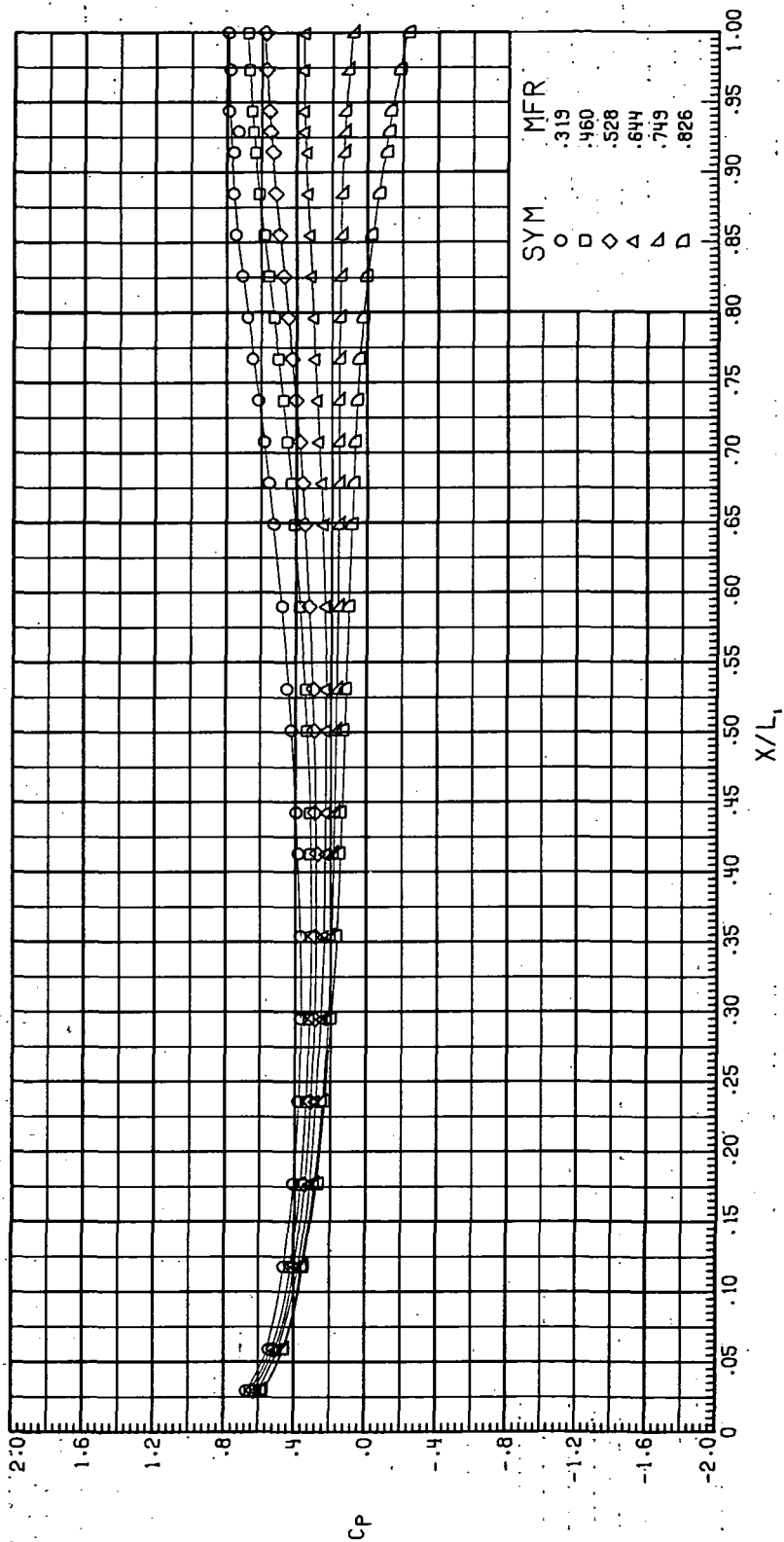
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



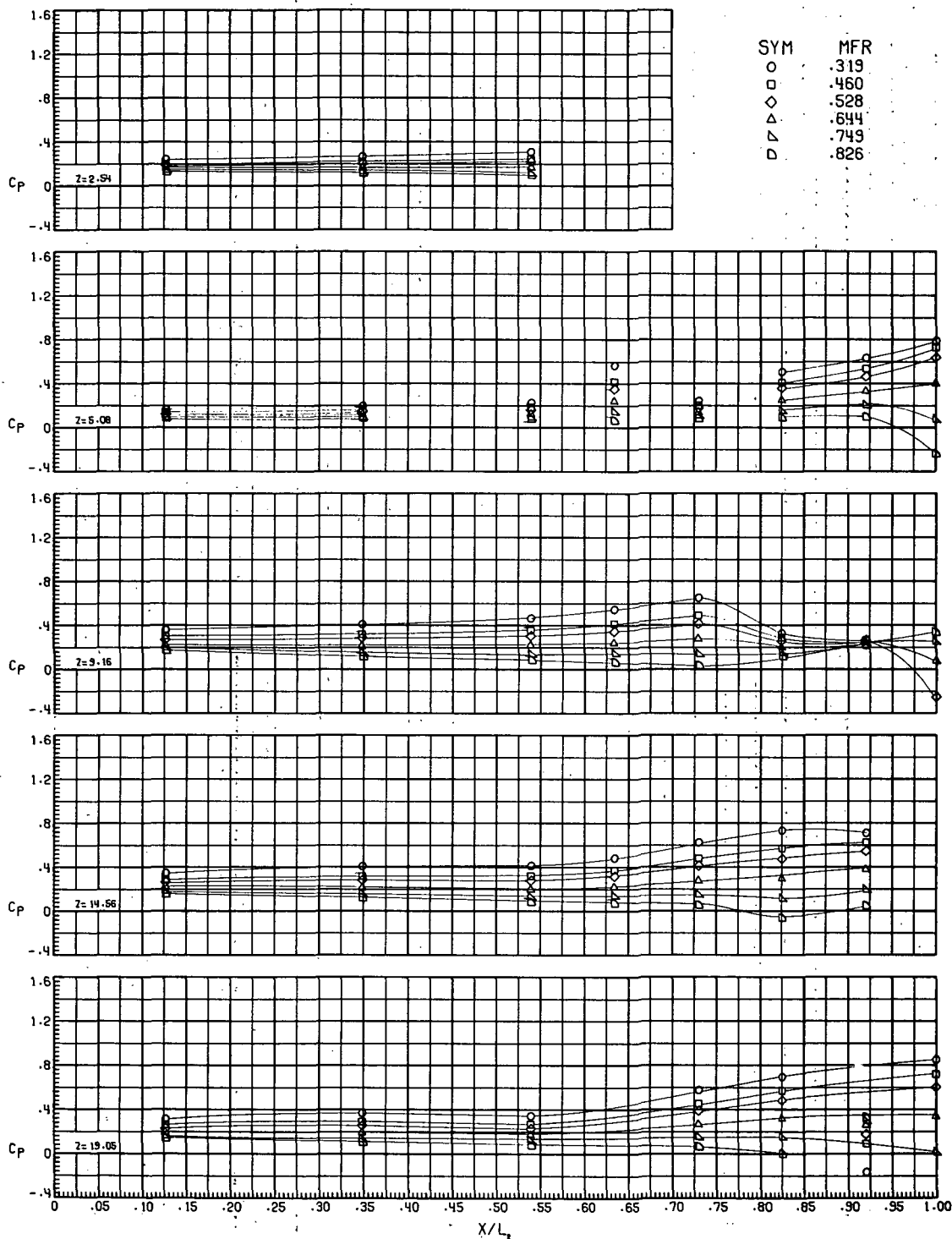
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24. - Continued.



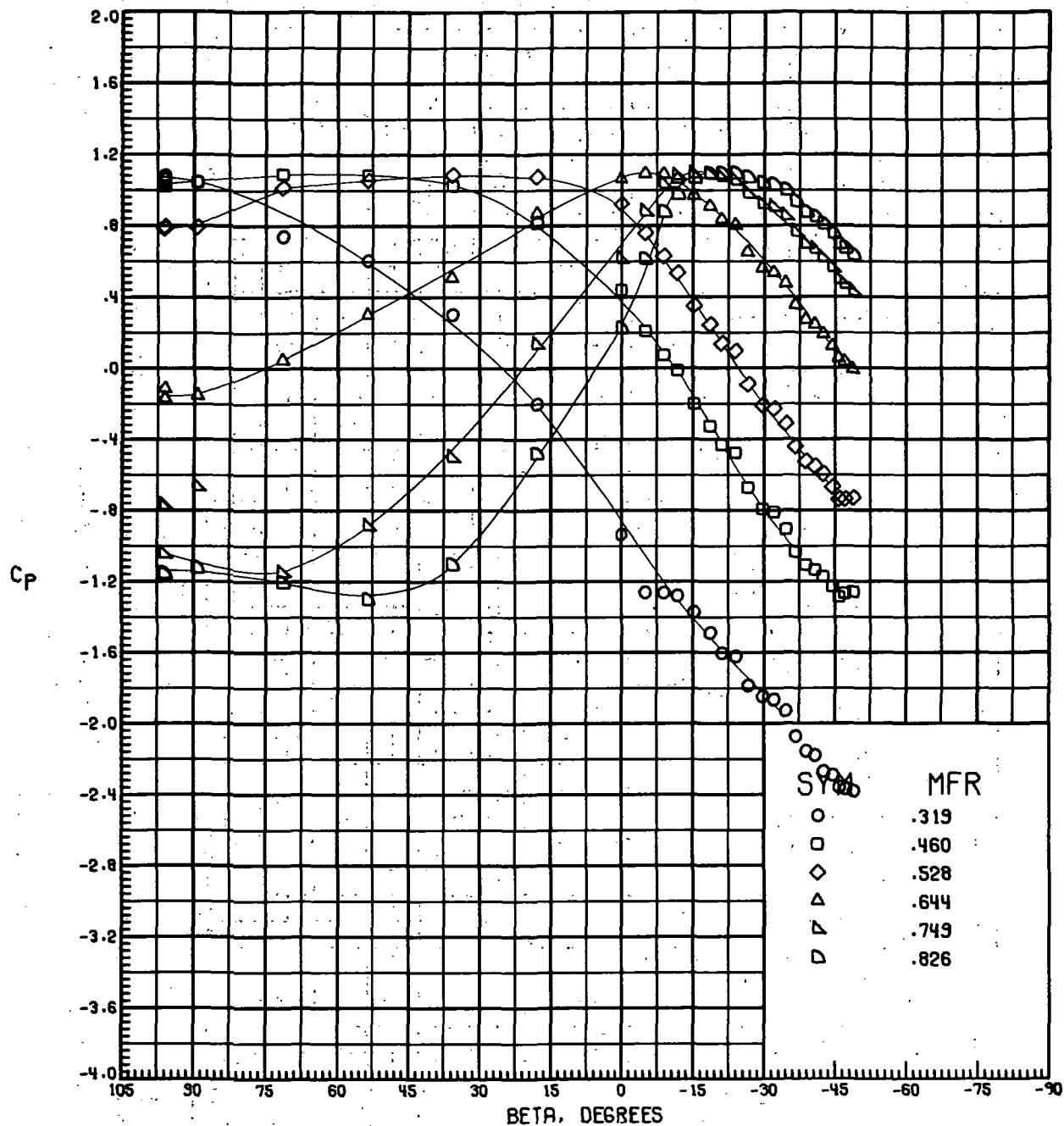
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 24.- Continued.



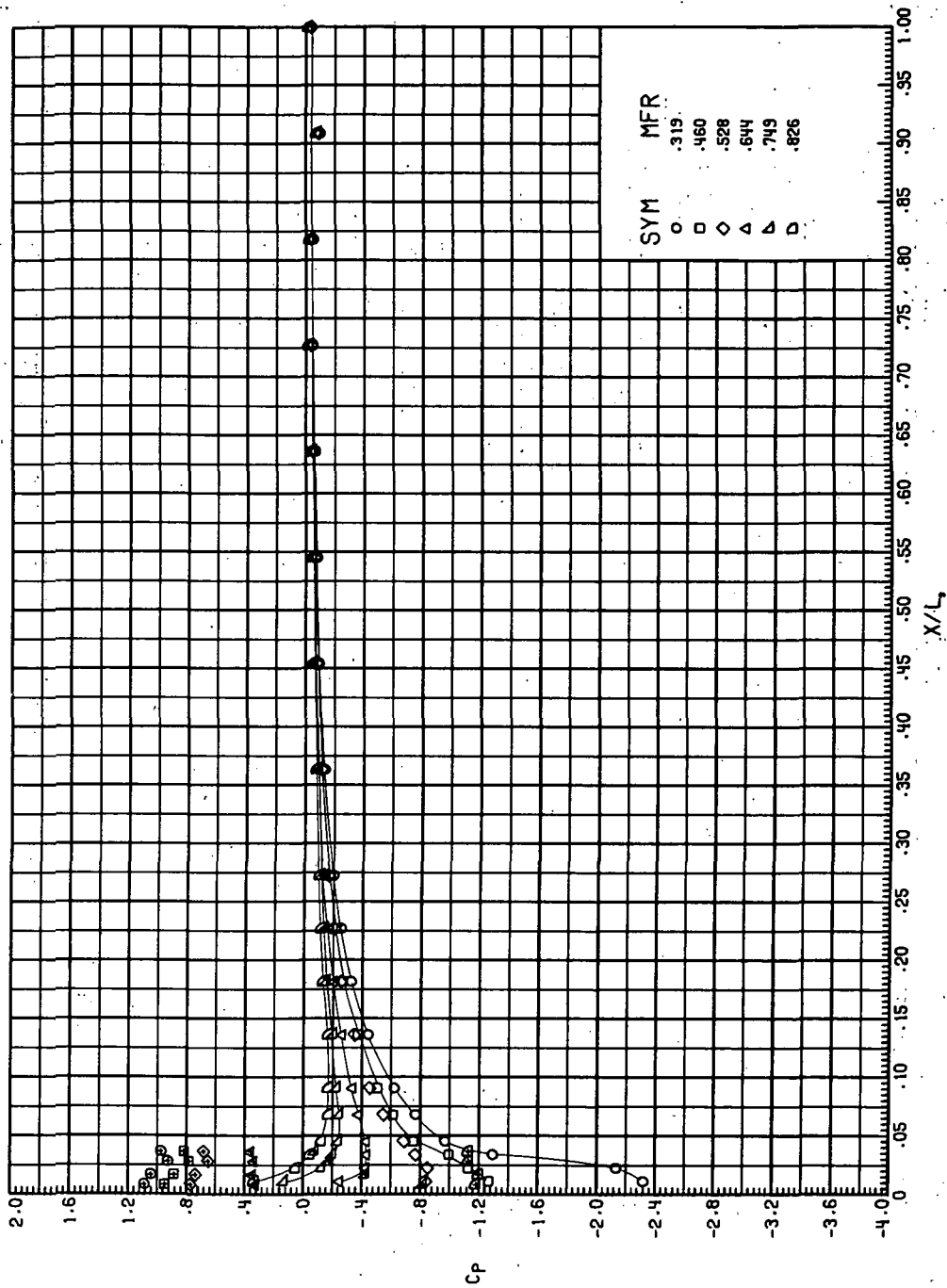
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



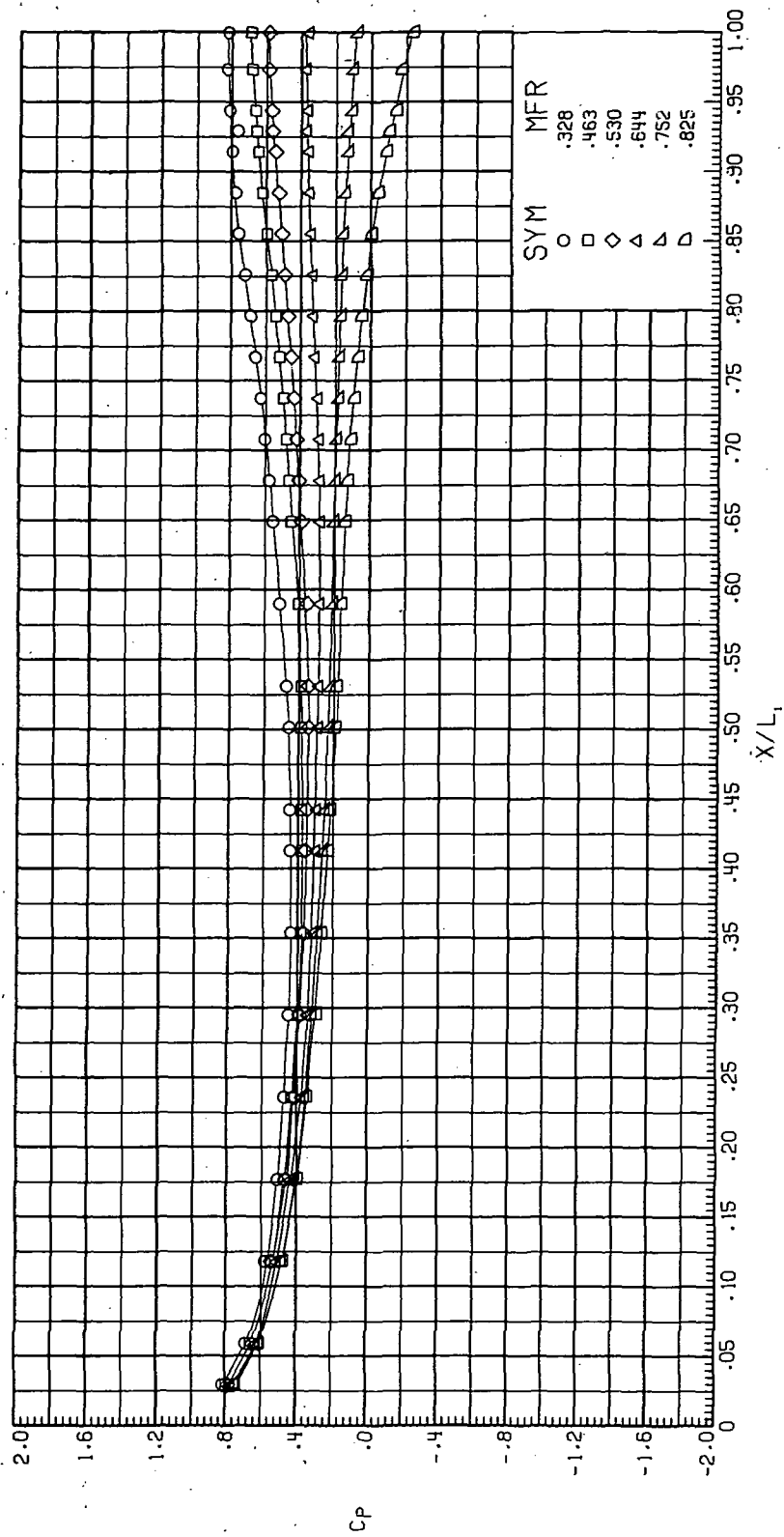
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



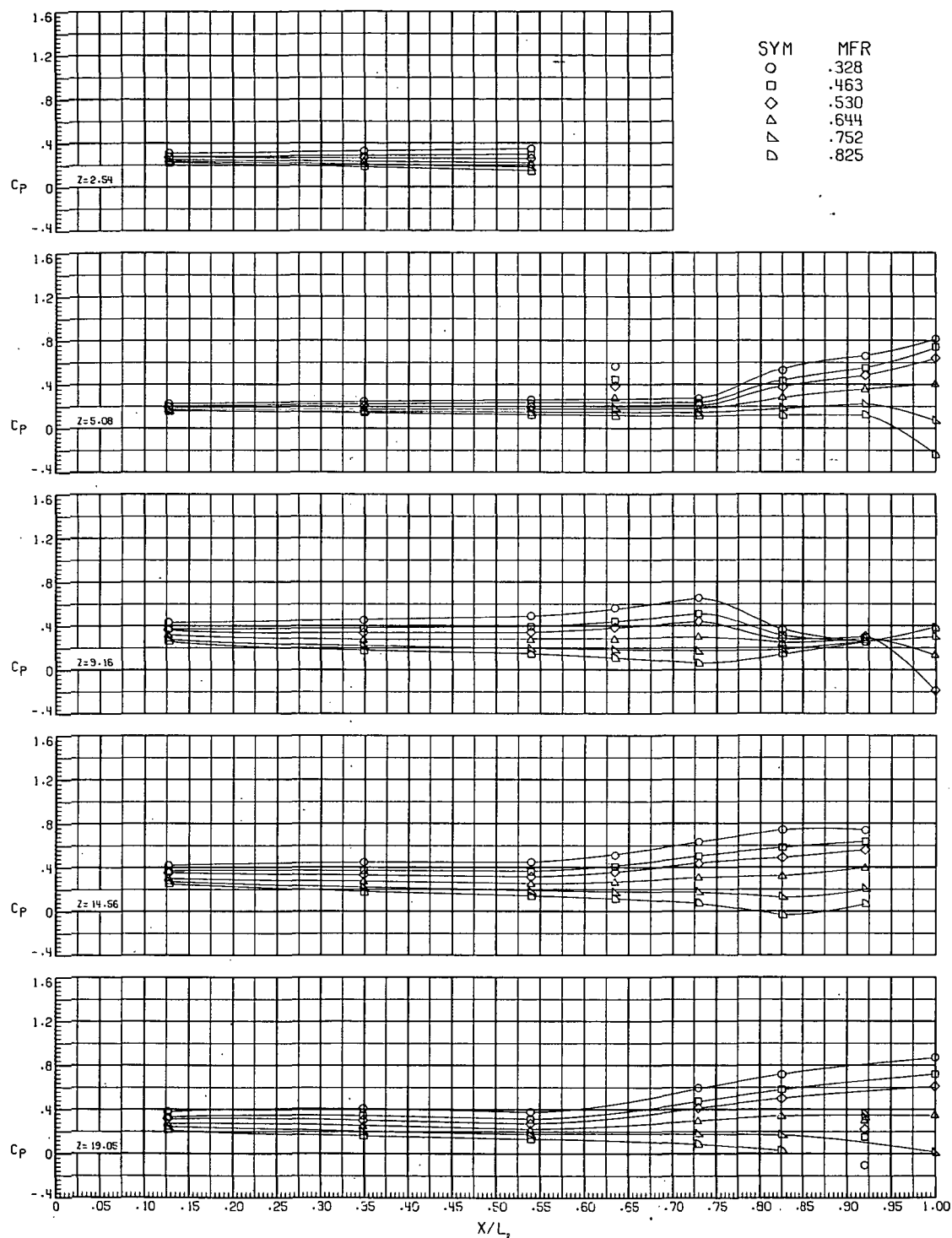
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24. - Continued.



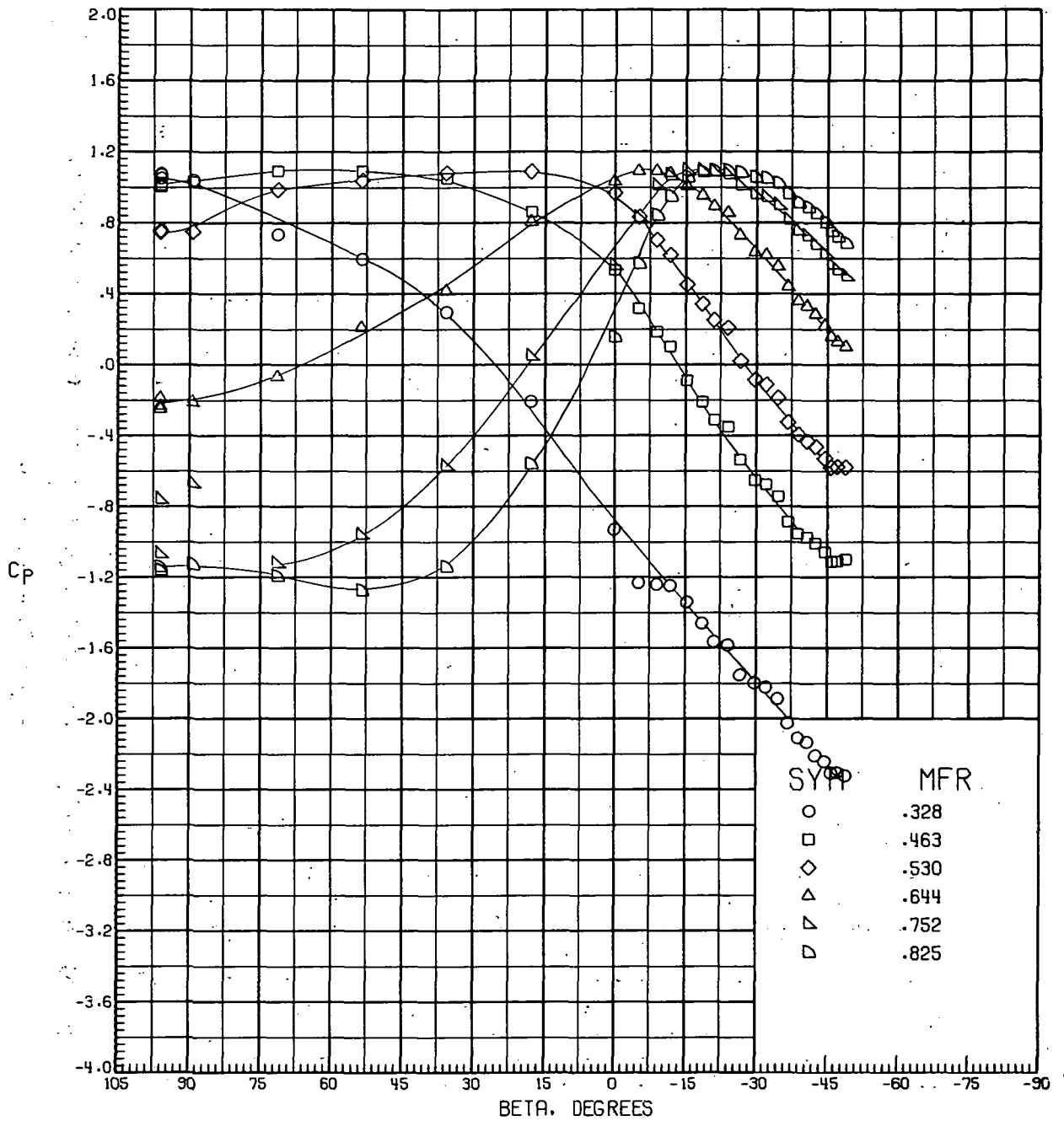
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 24.- Continued.



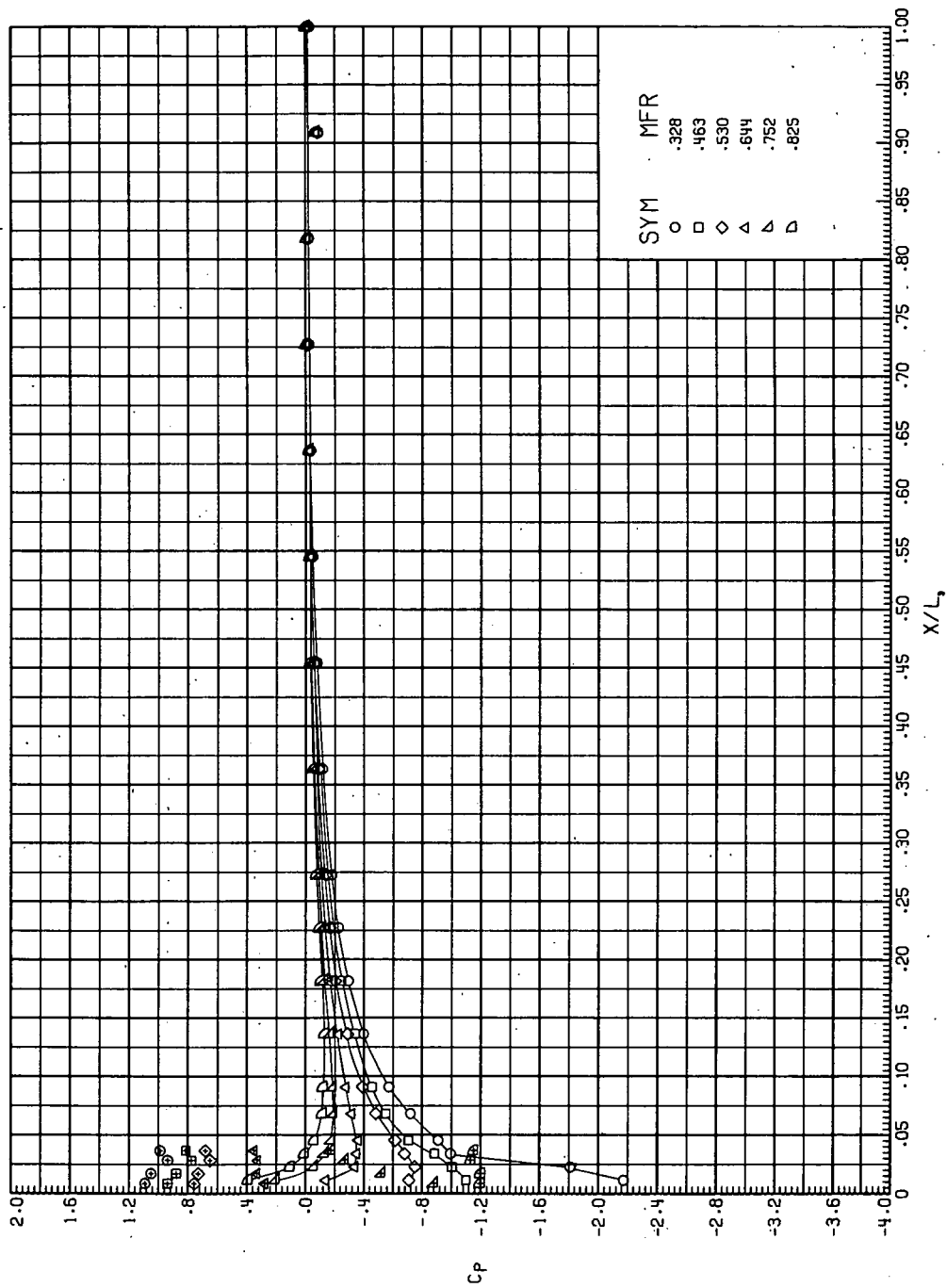
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 24. - Continued.



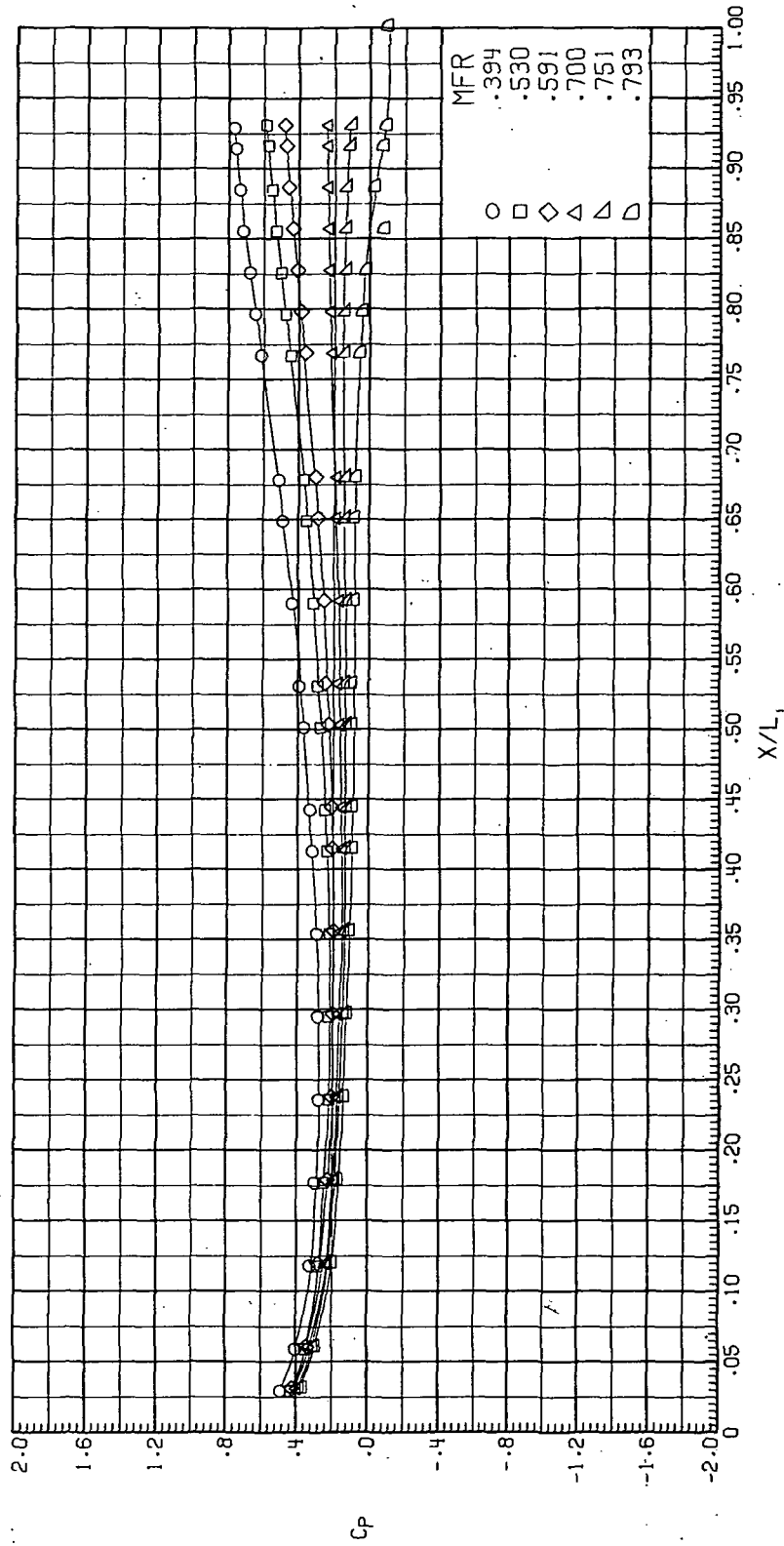
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



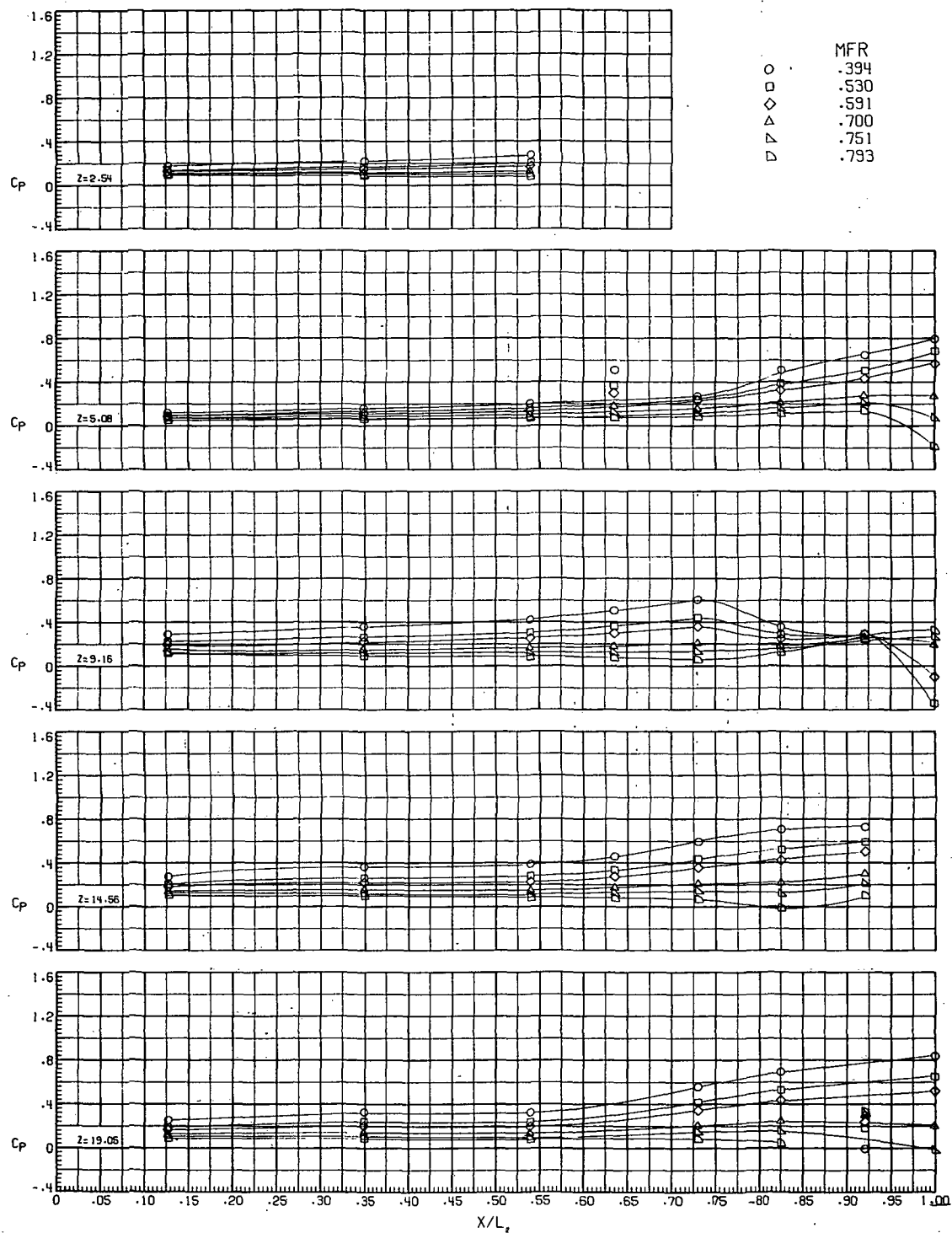
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24.- Continued.



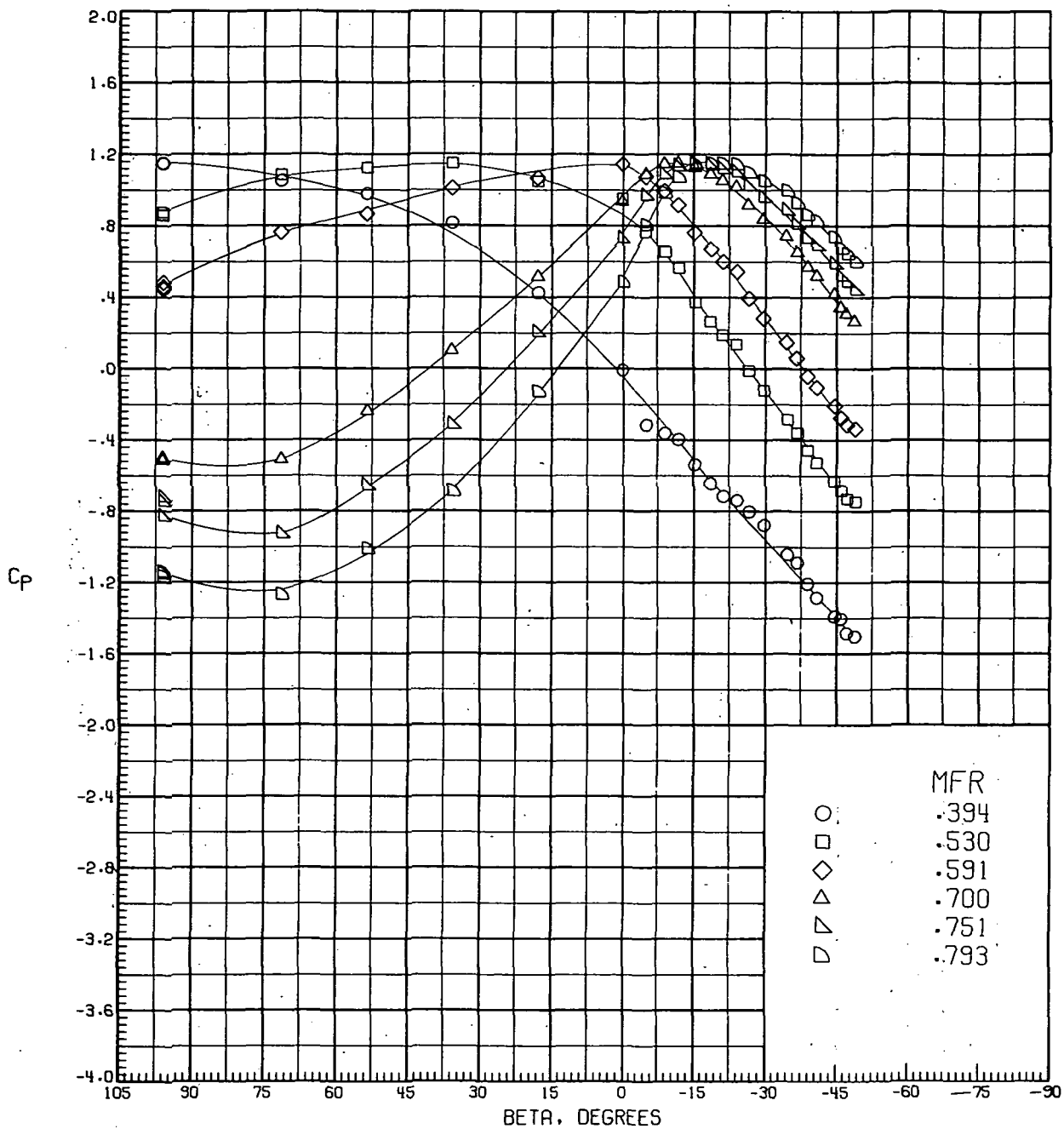
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 24. - Continued.



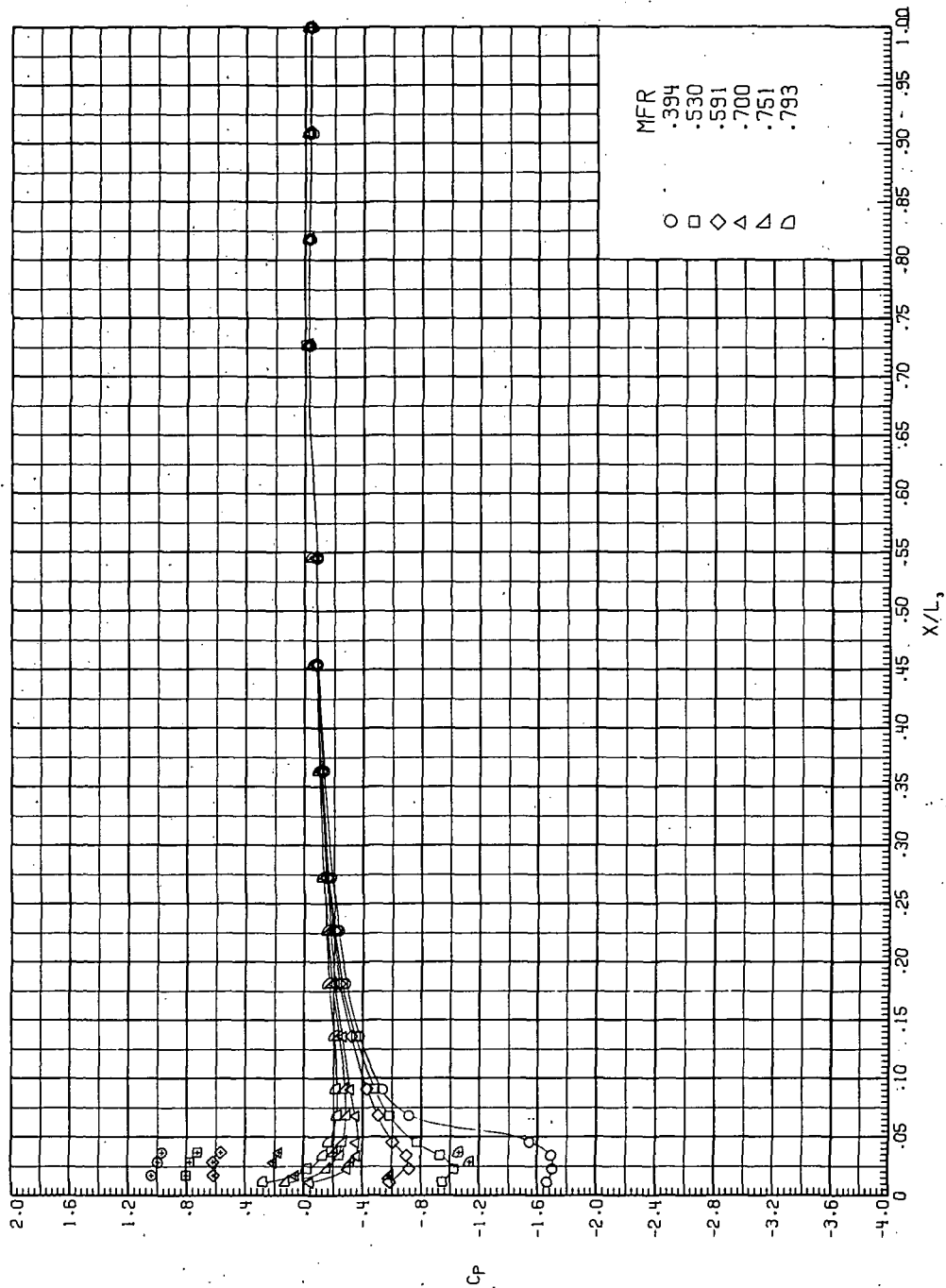
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



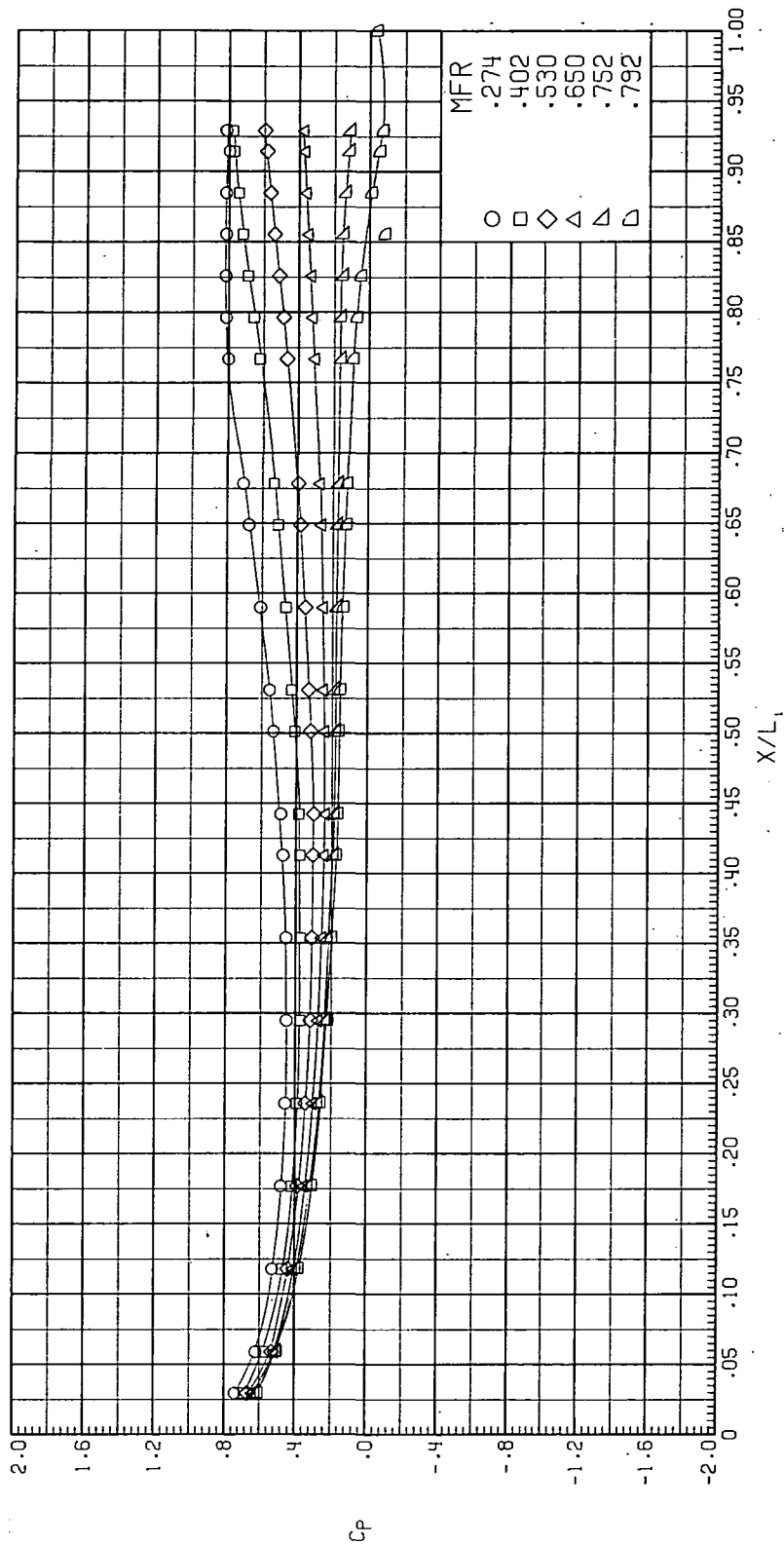
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



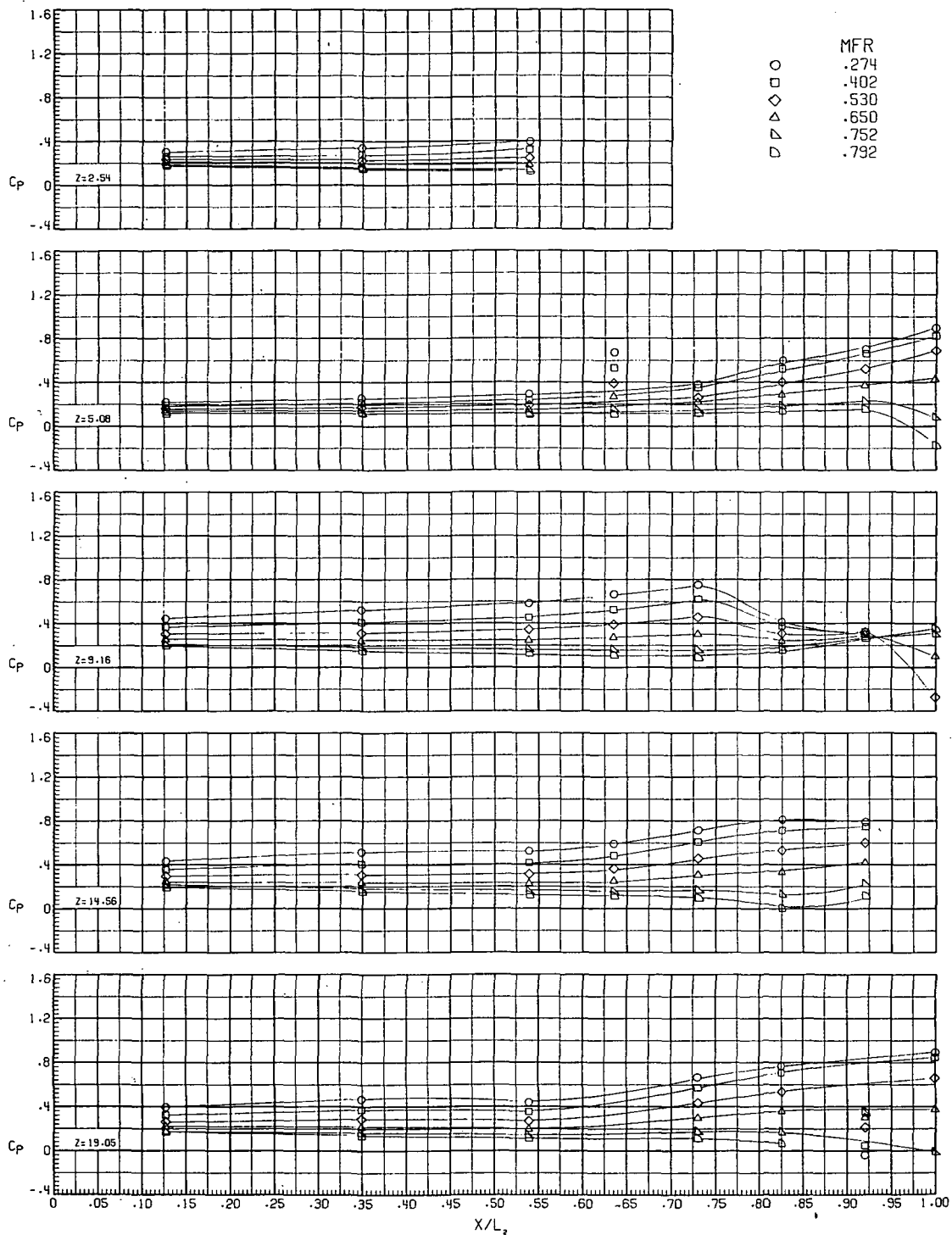
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24. - Continued.



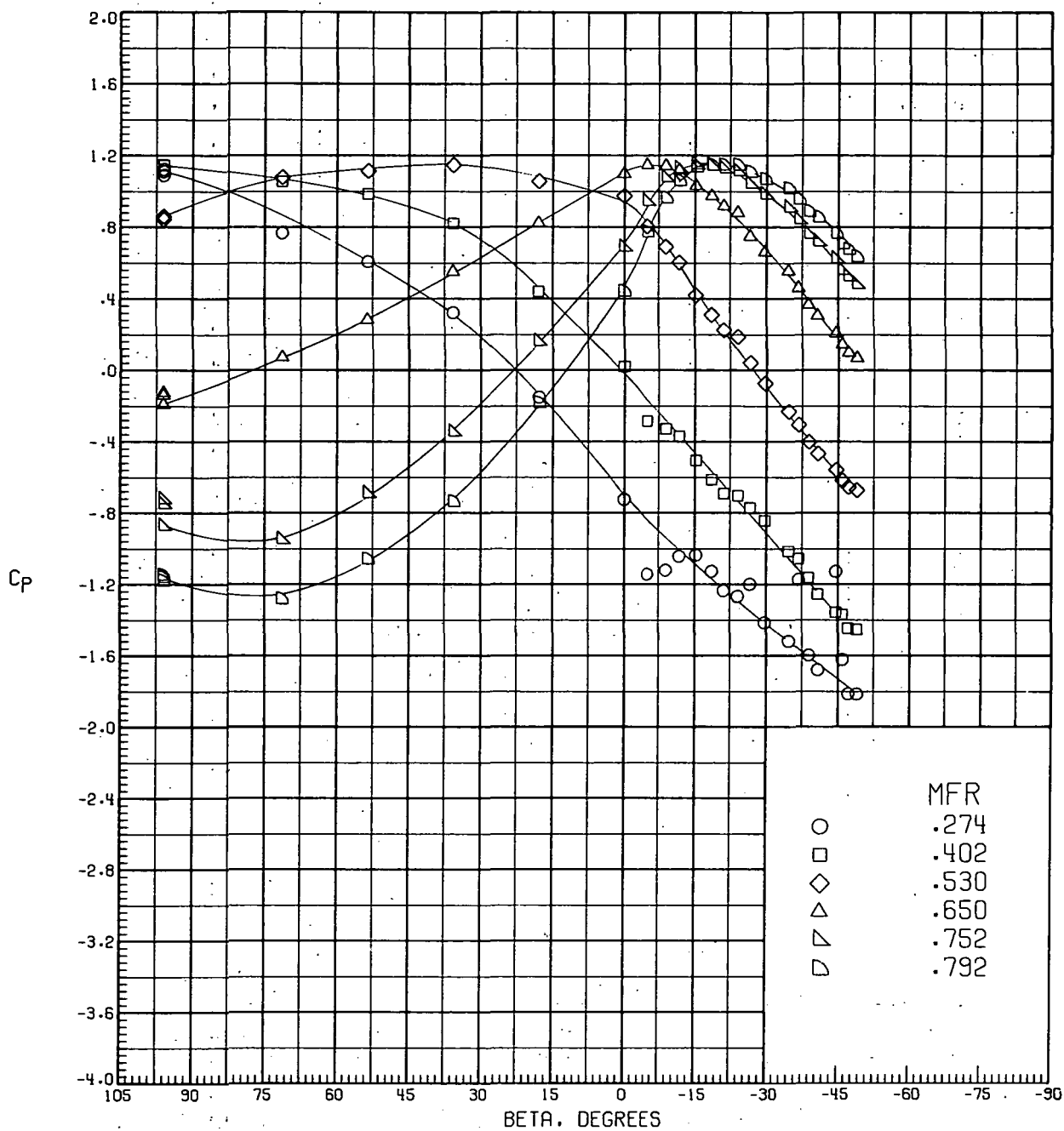
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 24.- Continued.



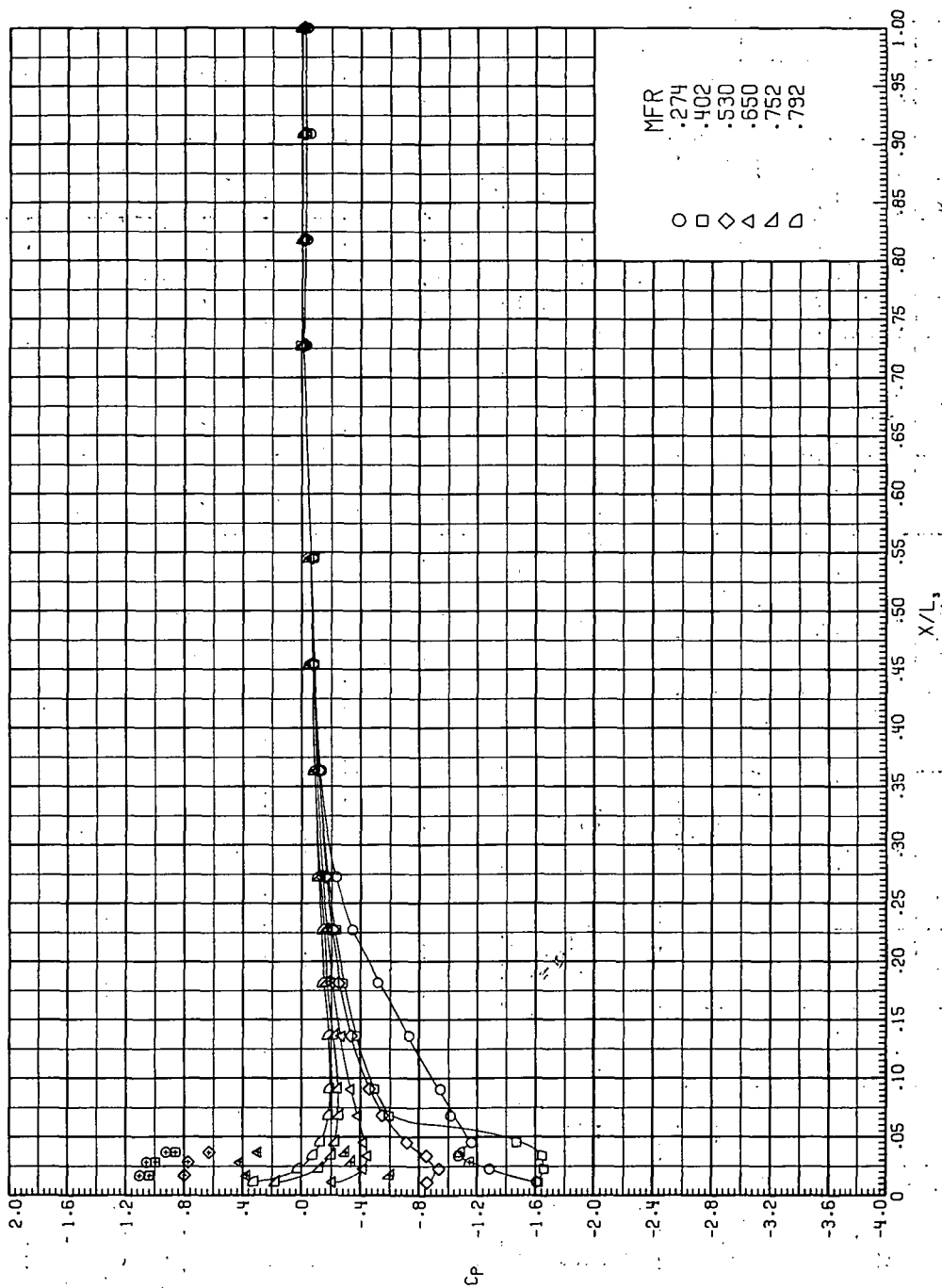
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 24.-Continued.



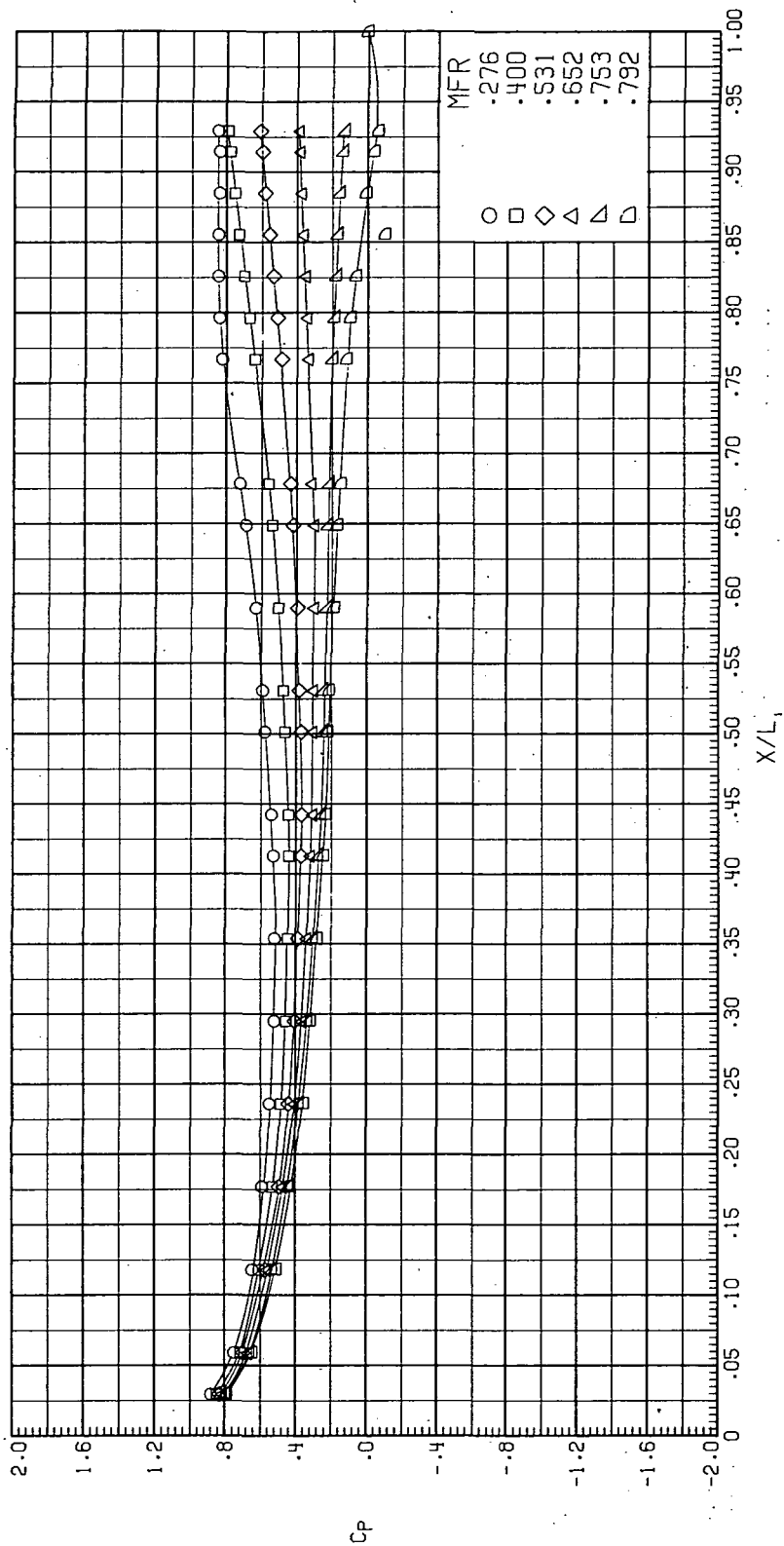
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



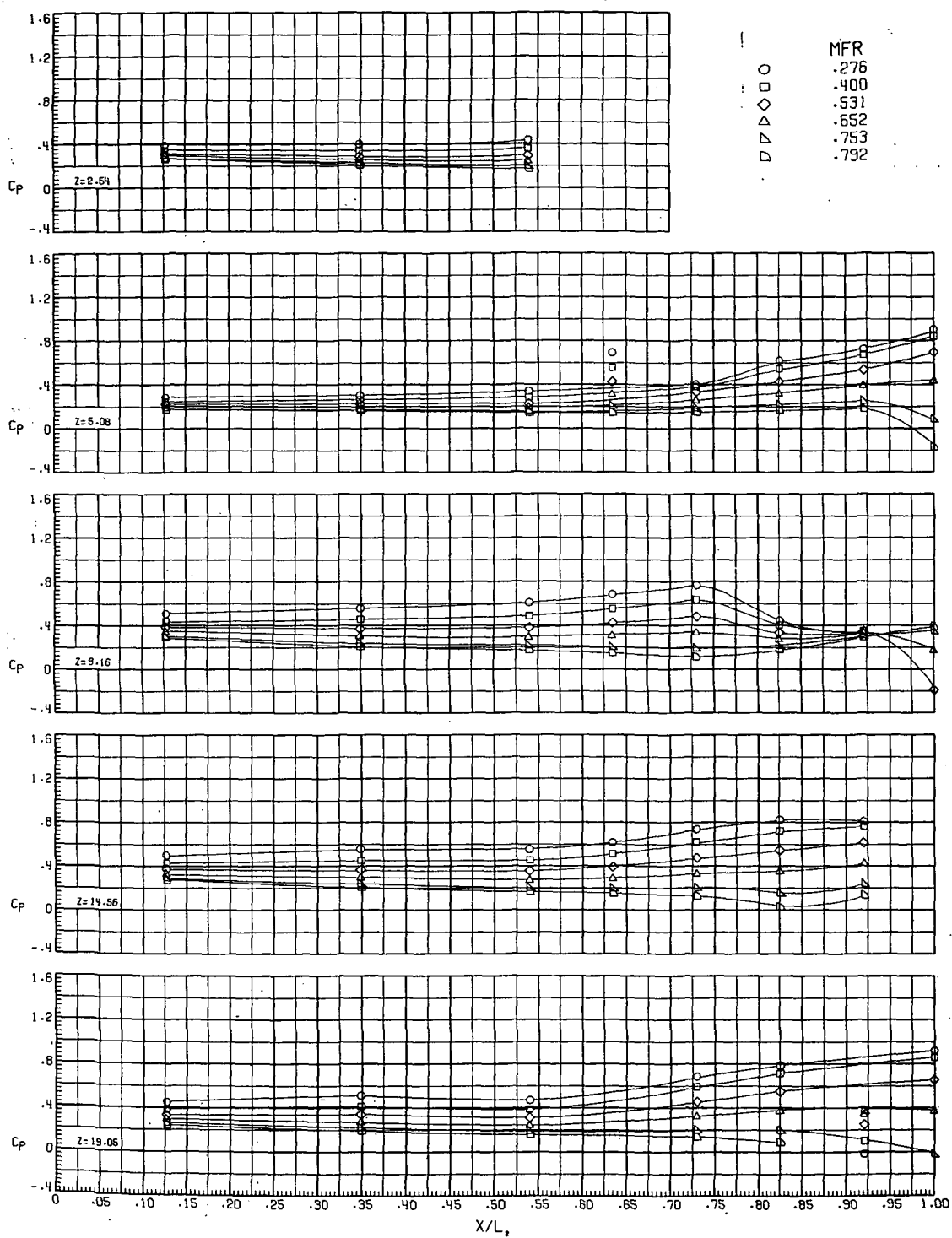
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24.- Continued.



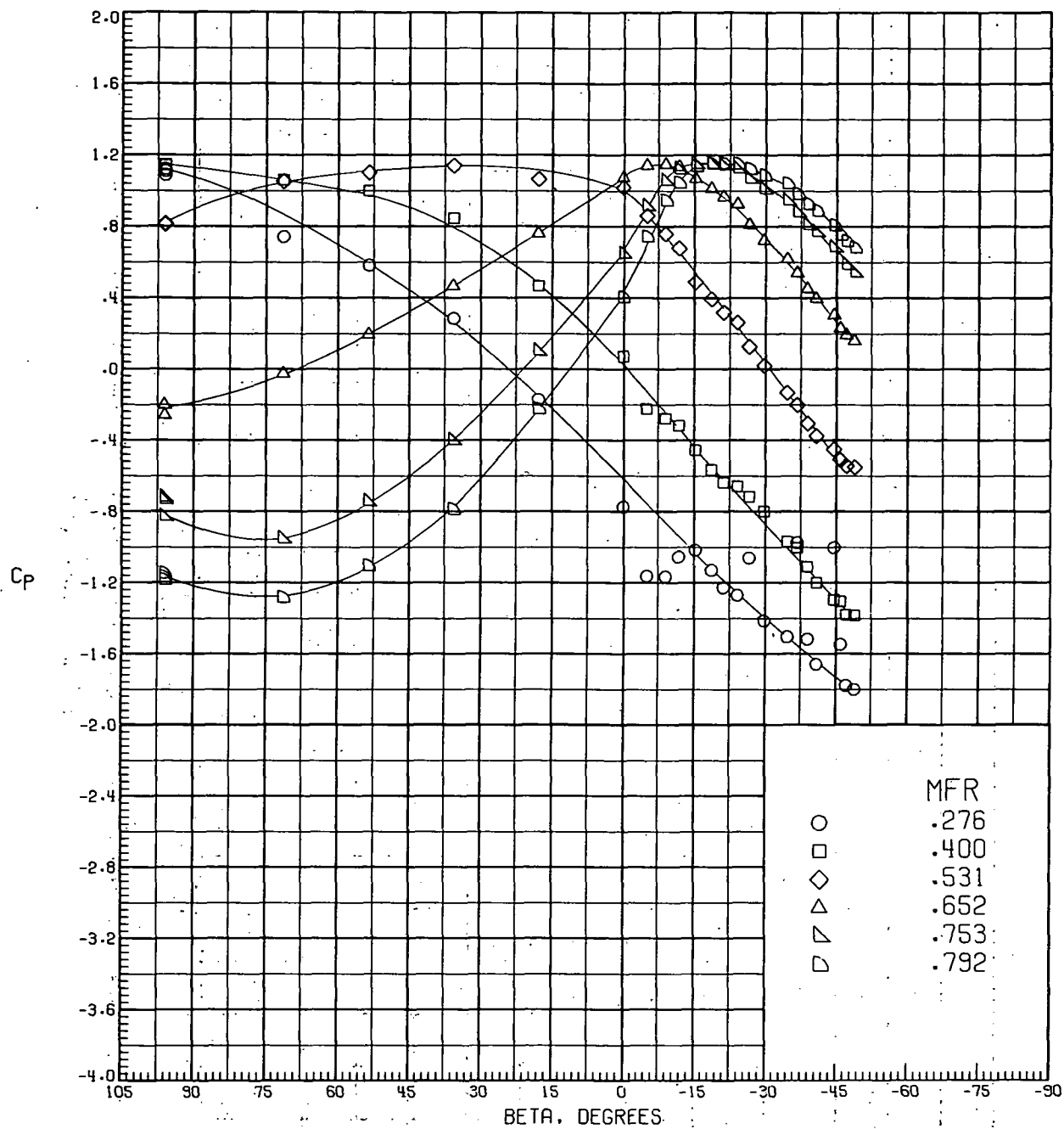
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 24. - Continued.



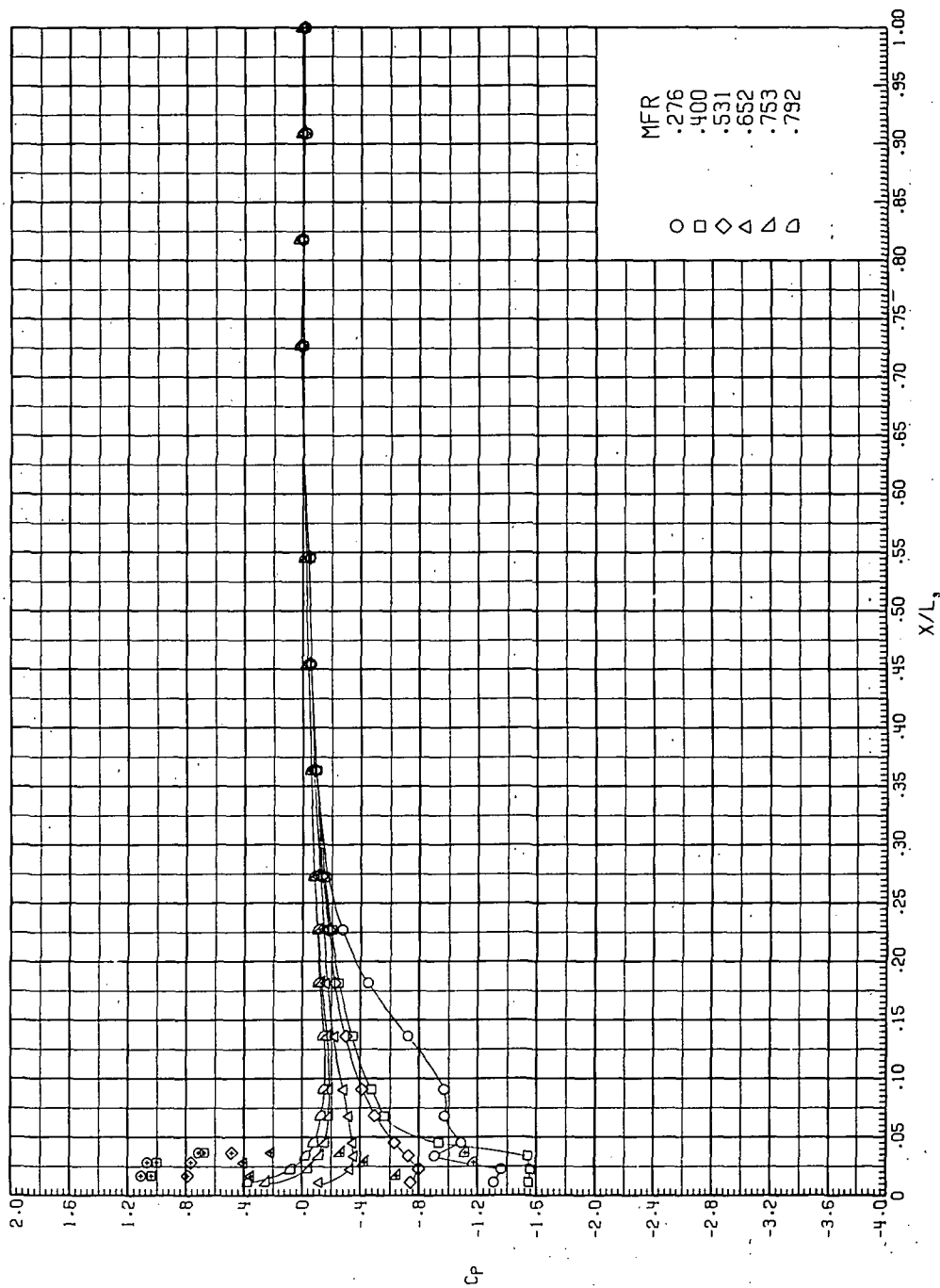
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



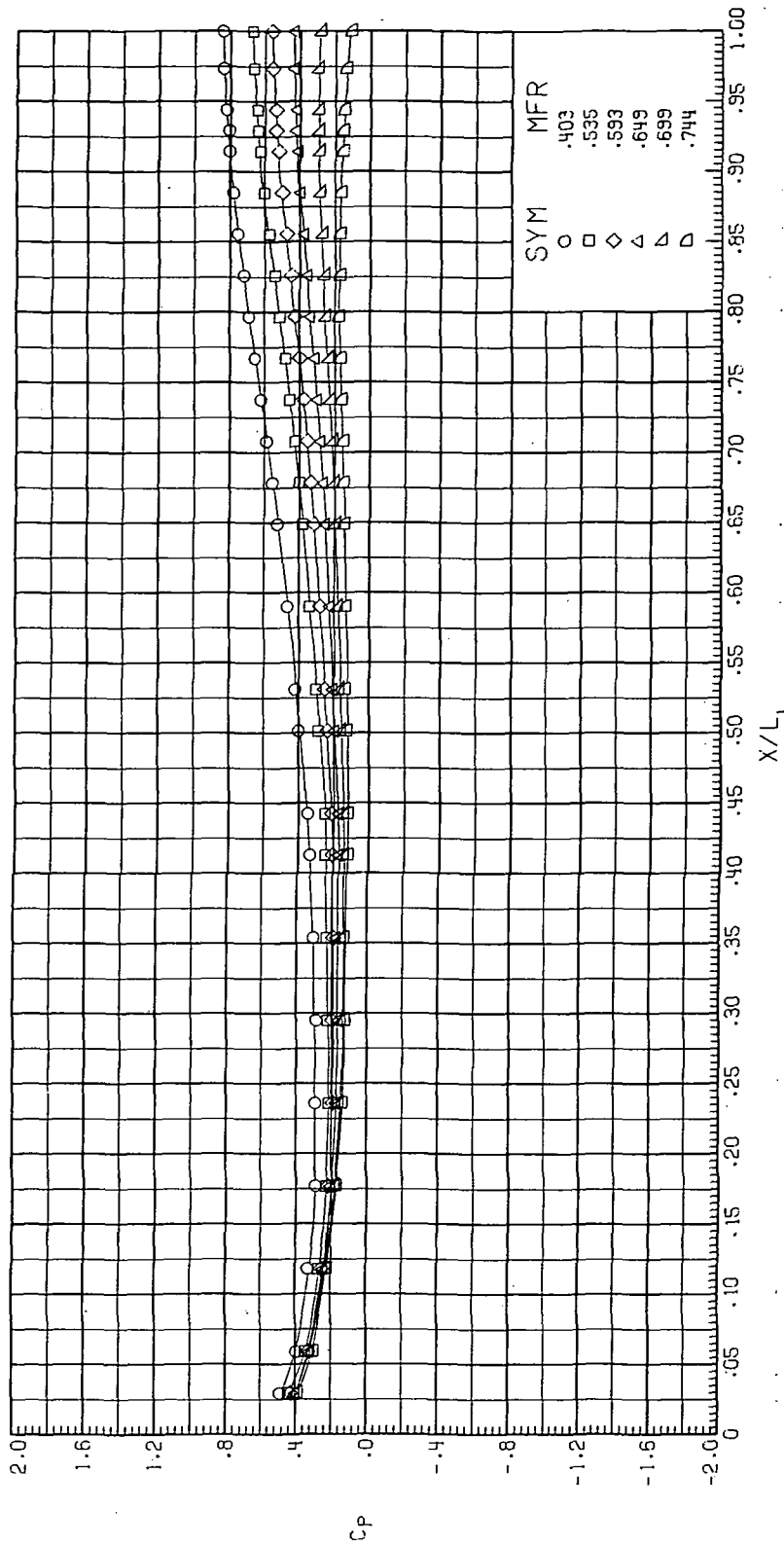
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



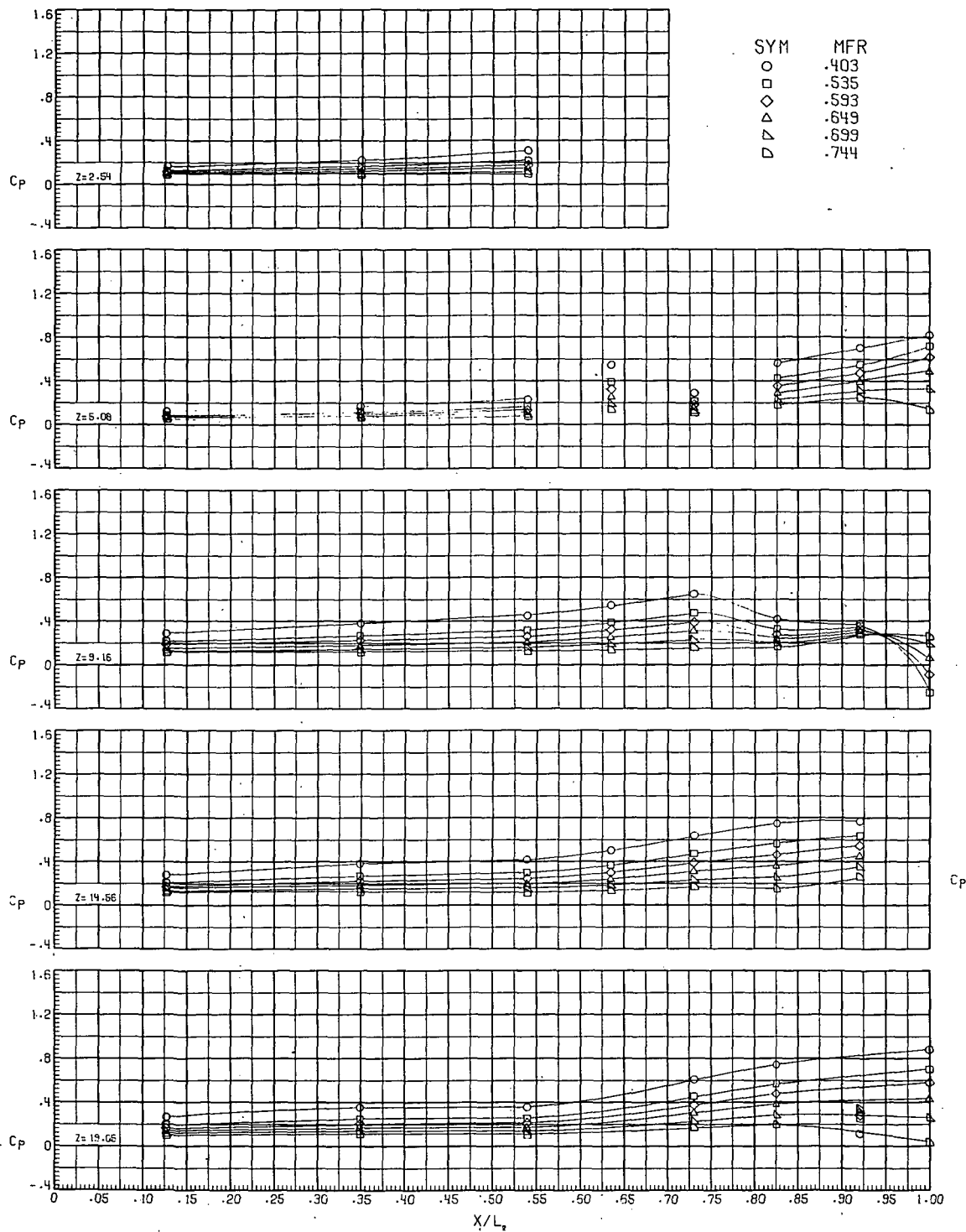
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24.- Continued.



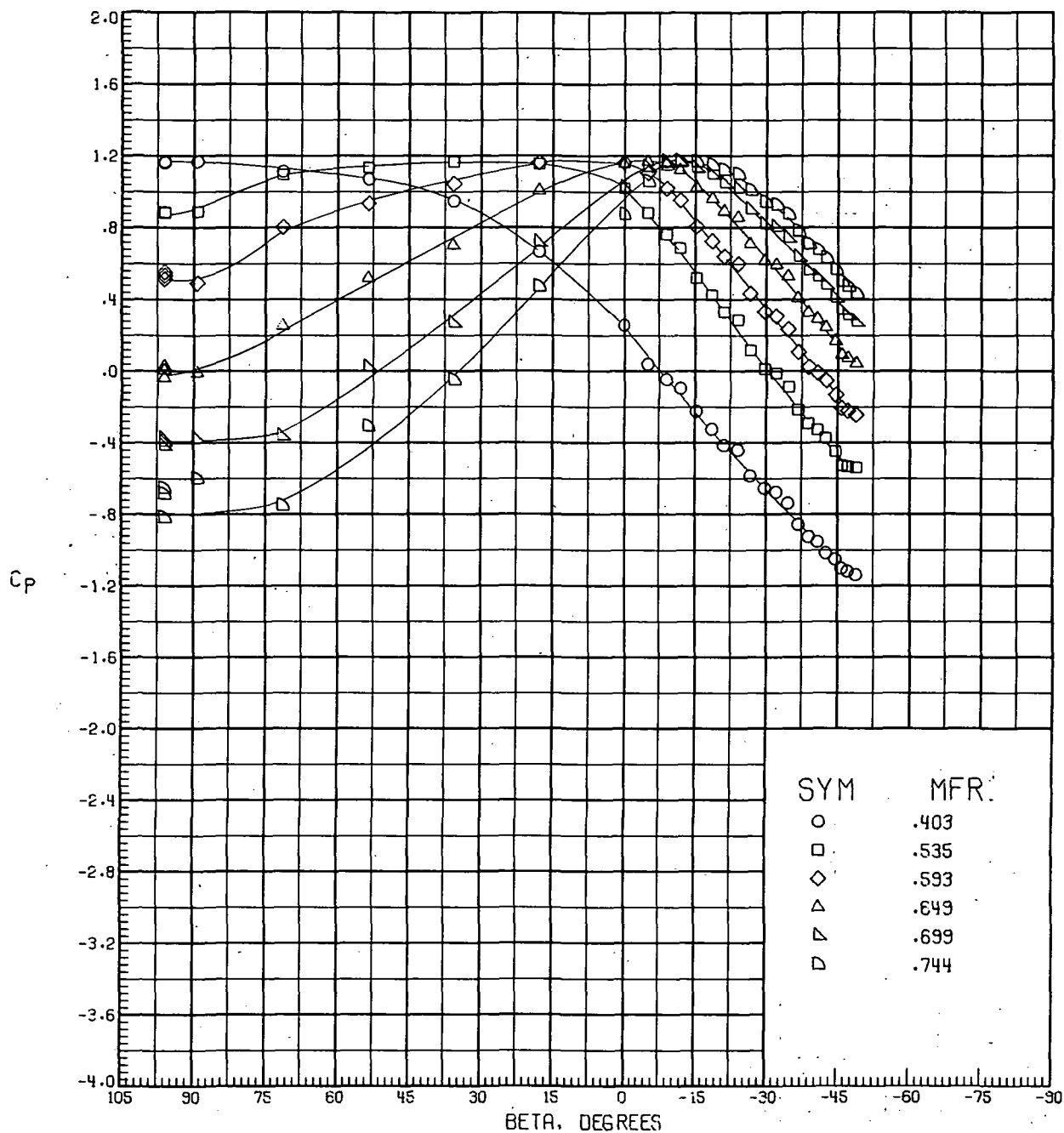
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 24. - Continued.



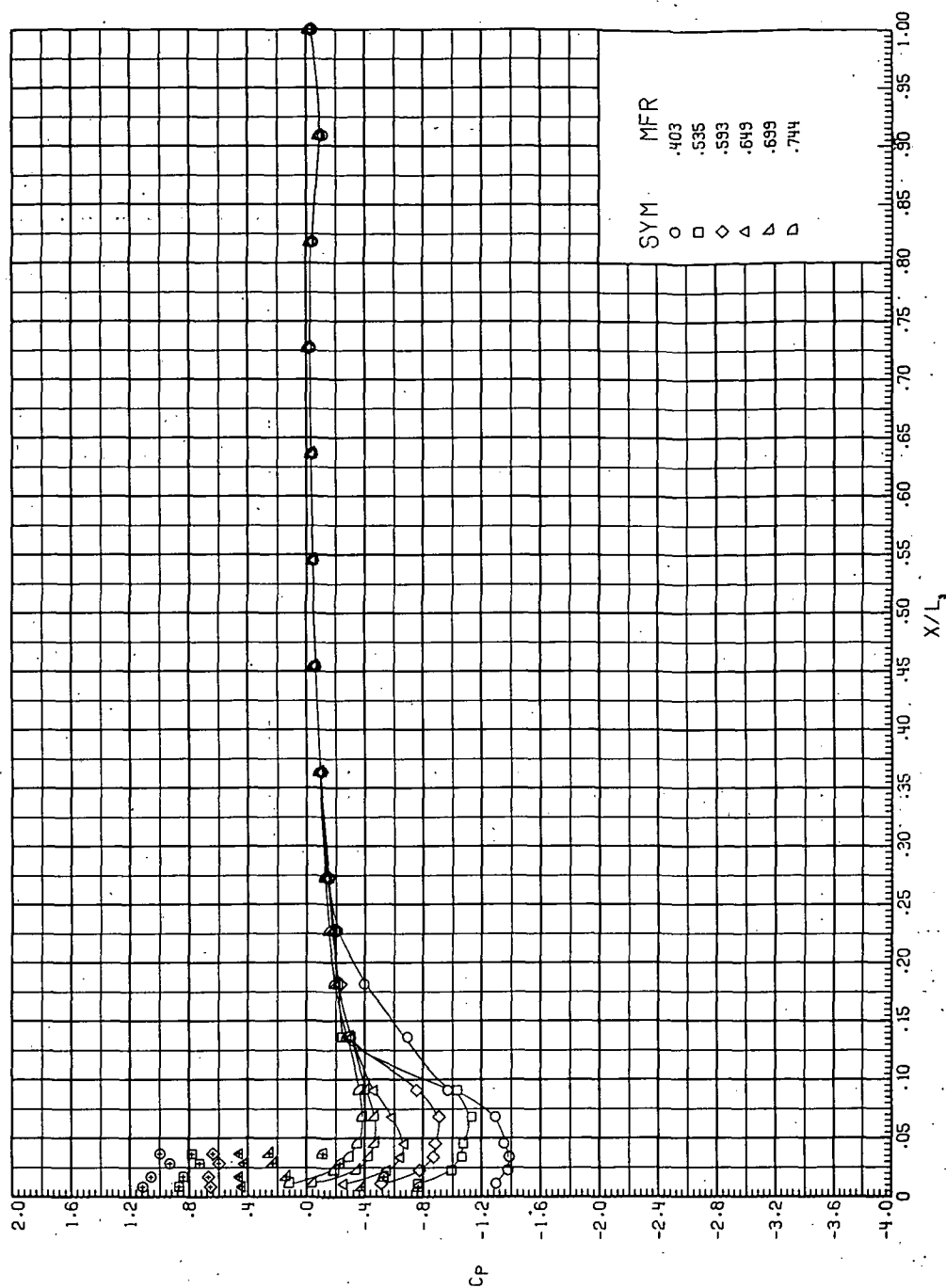
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



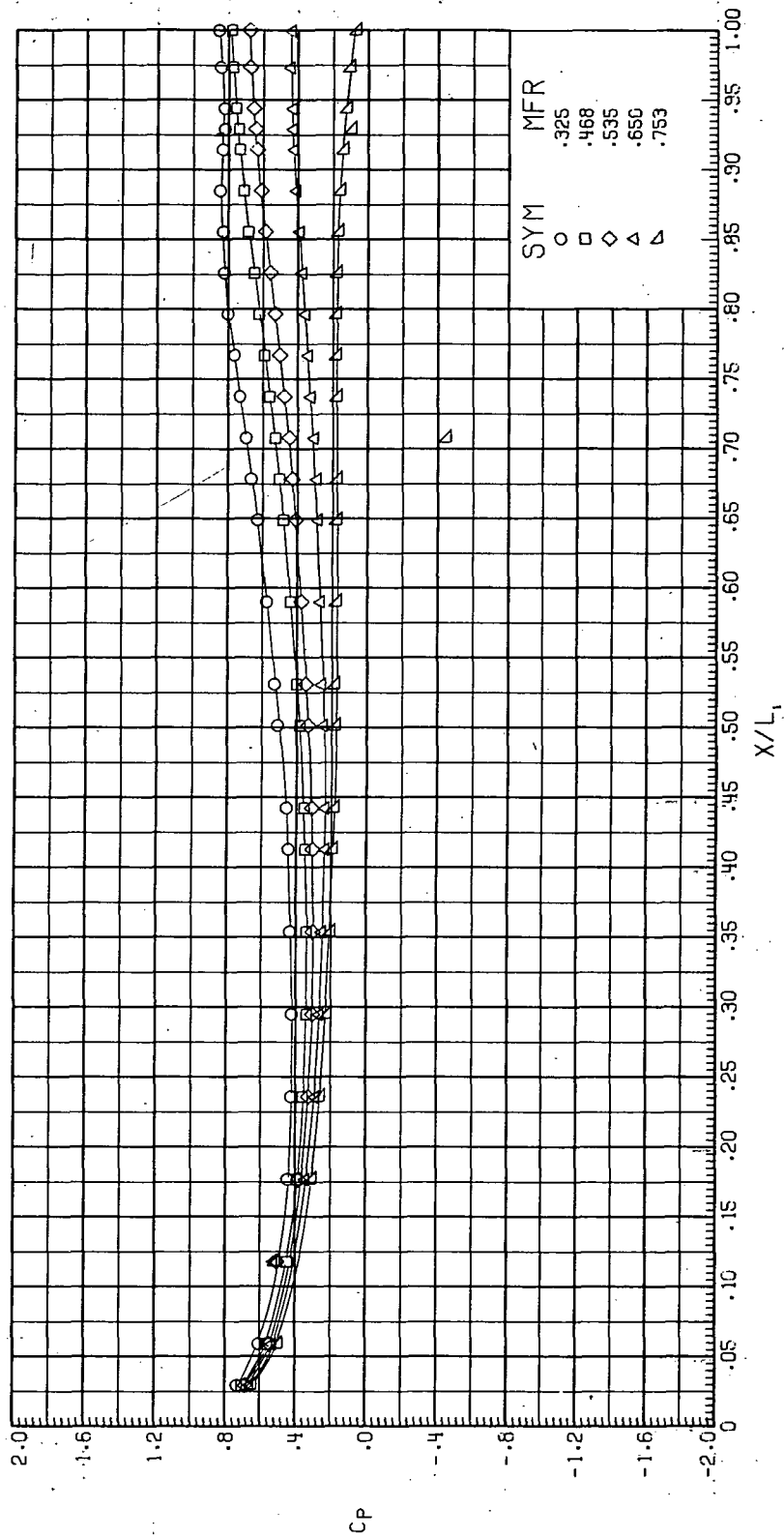
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



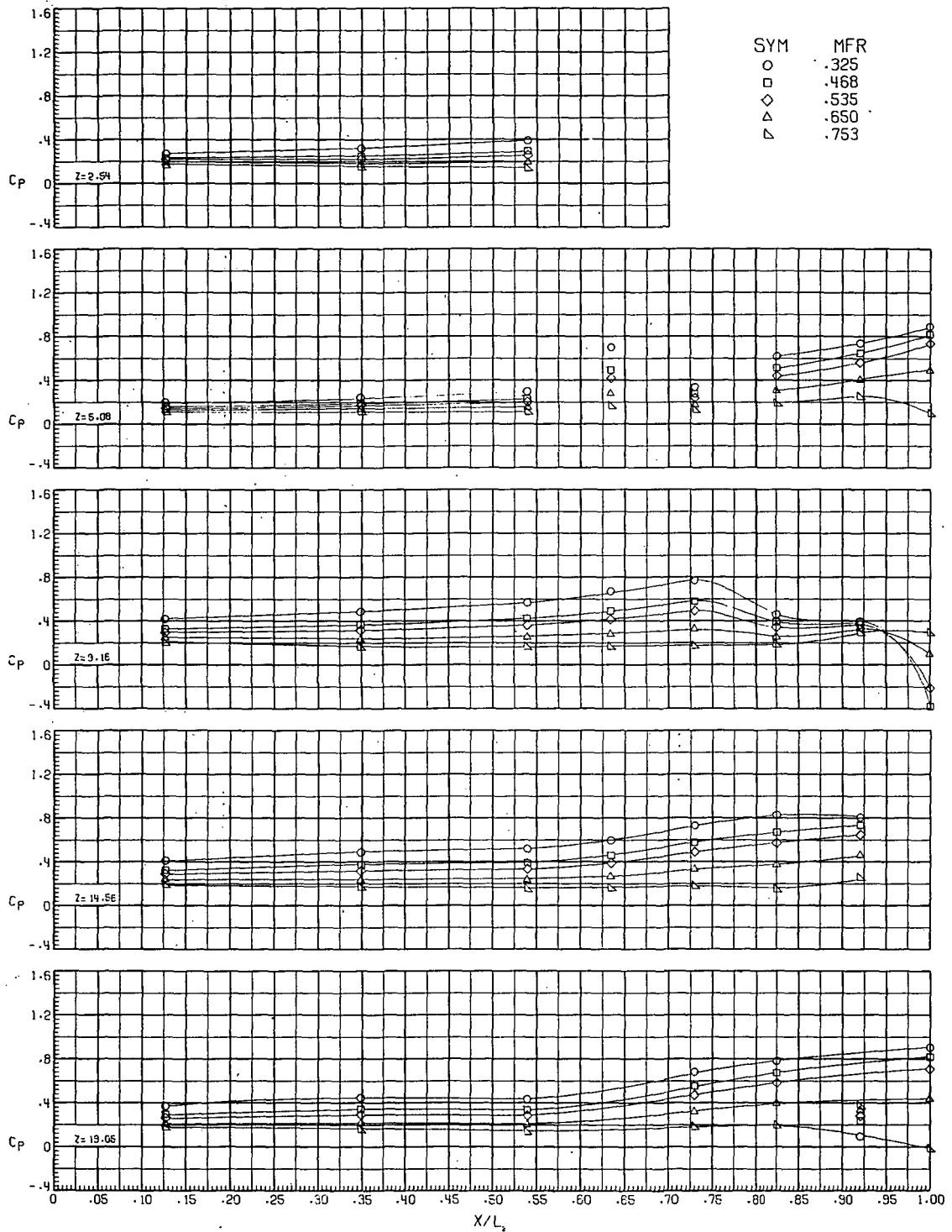
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients: Concluded.

Figure 24.- Continued.



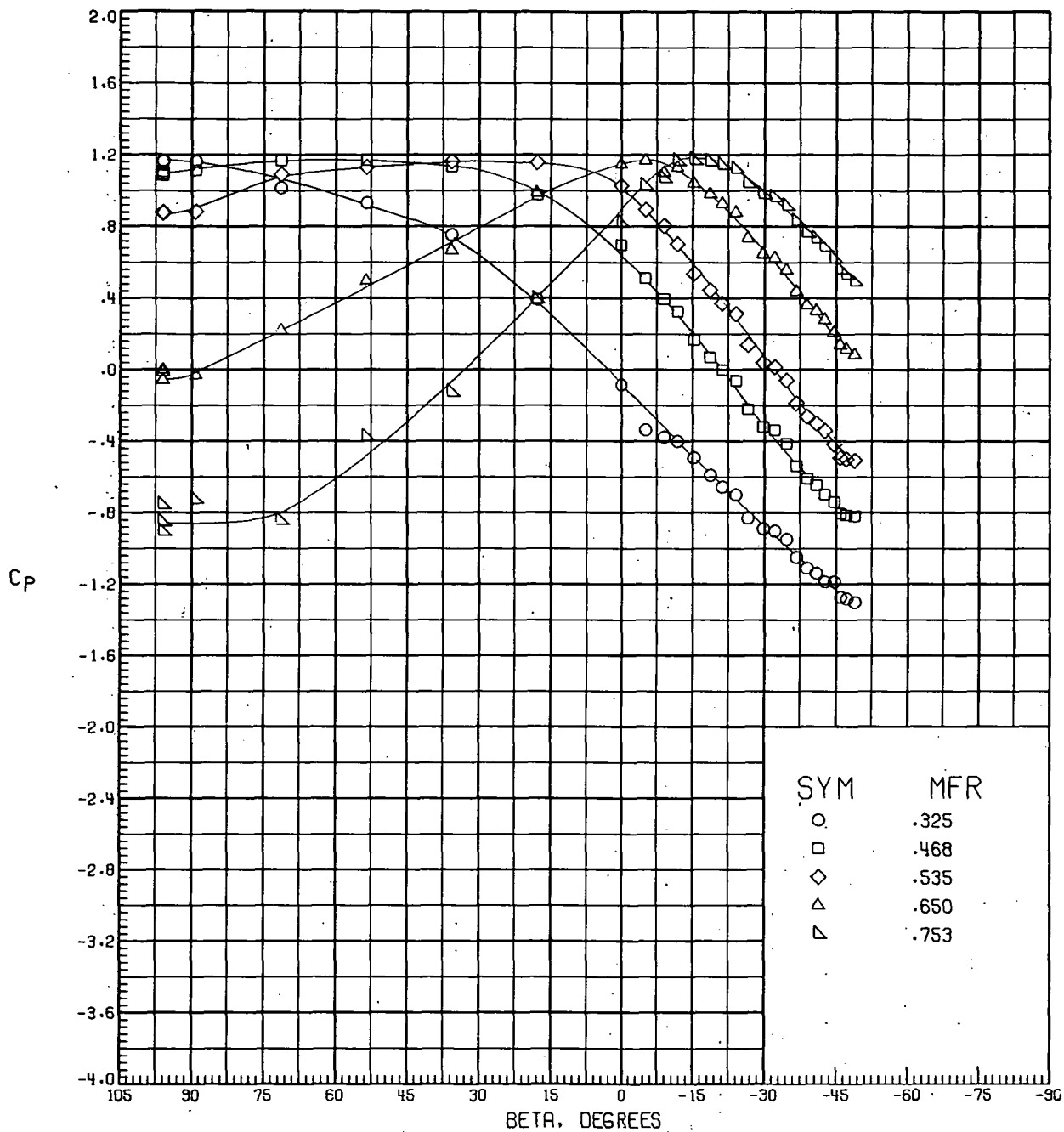
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 24.- Continued.



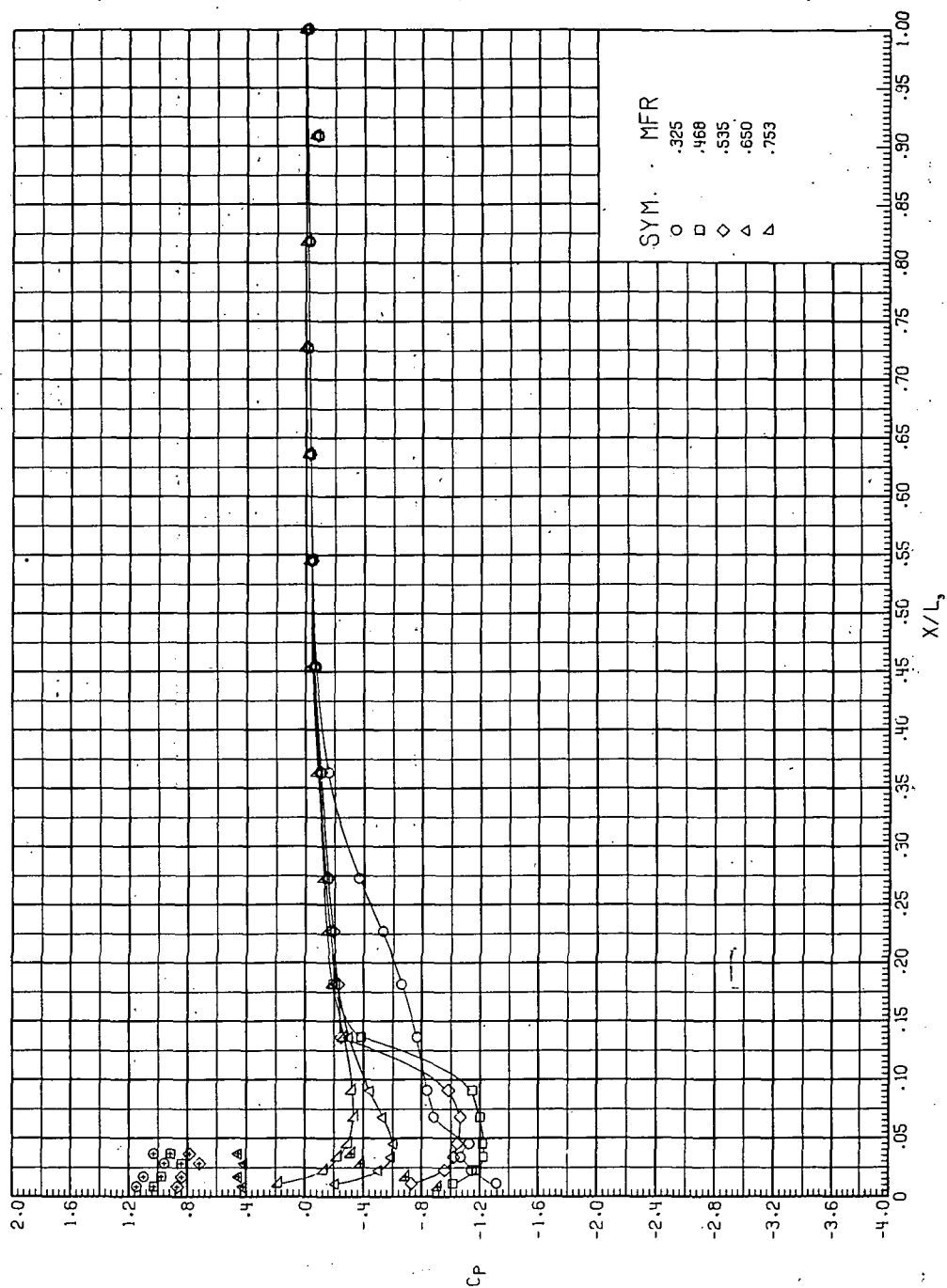
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 24. - Continued.



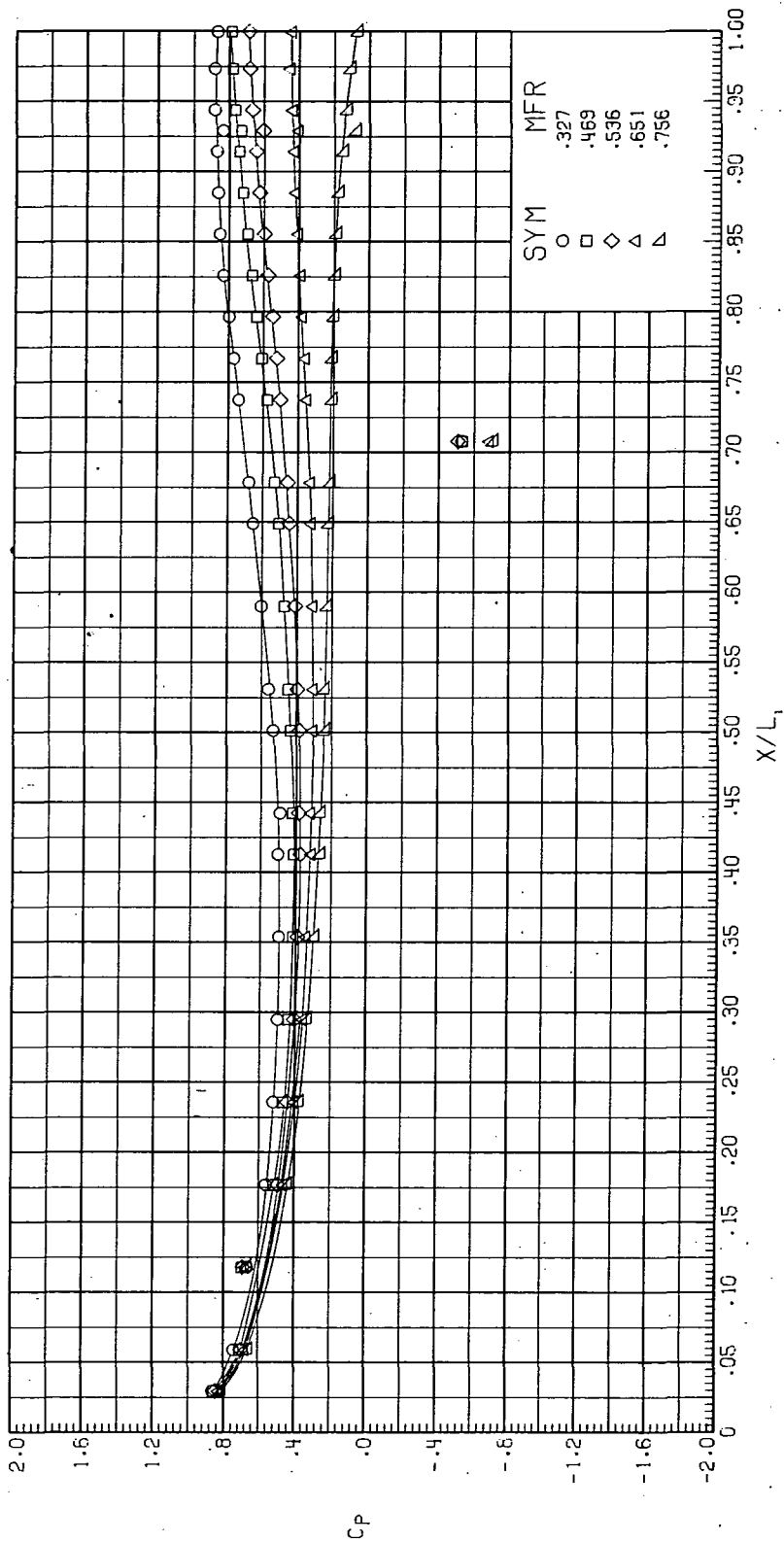
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



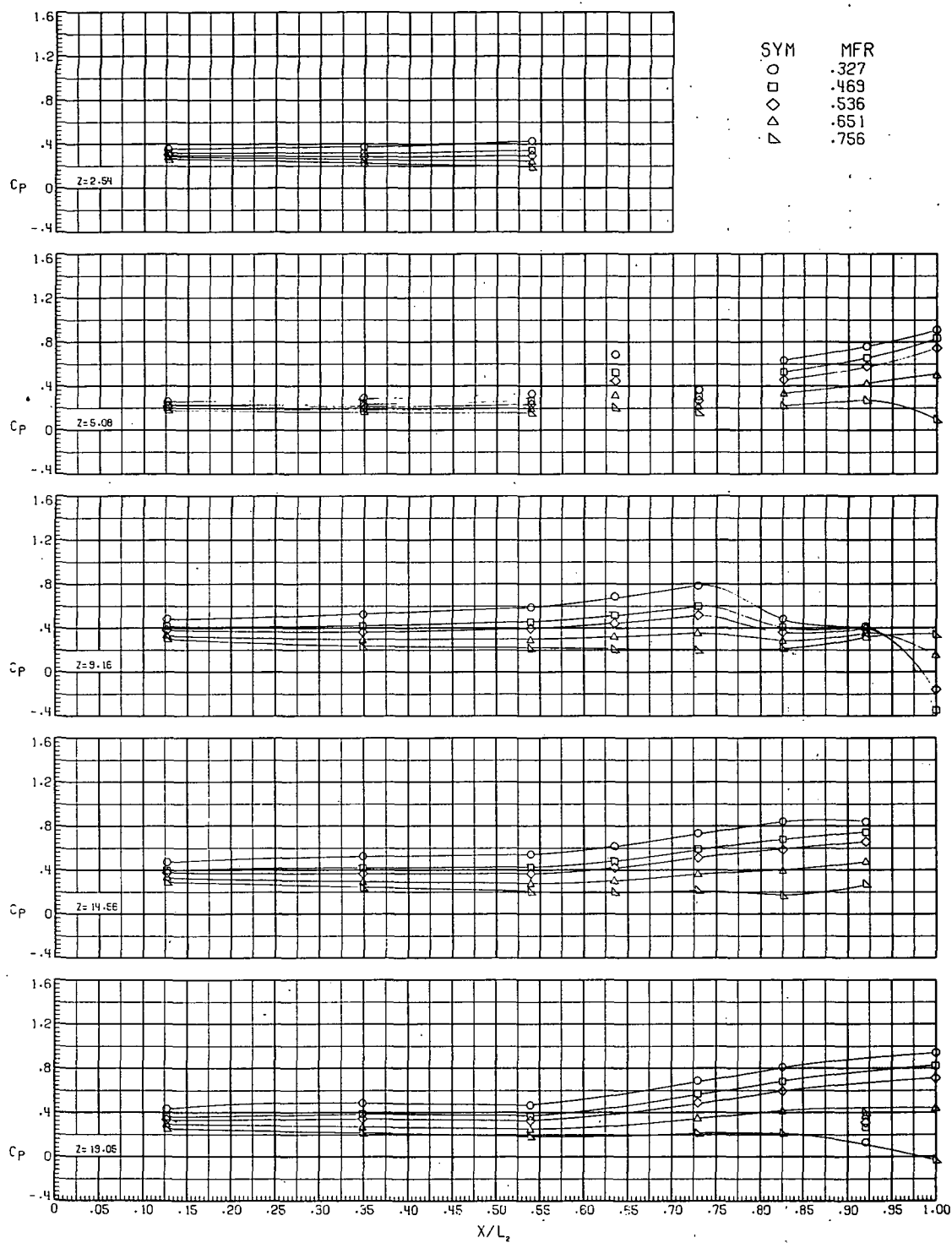
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24. - Continued.



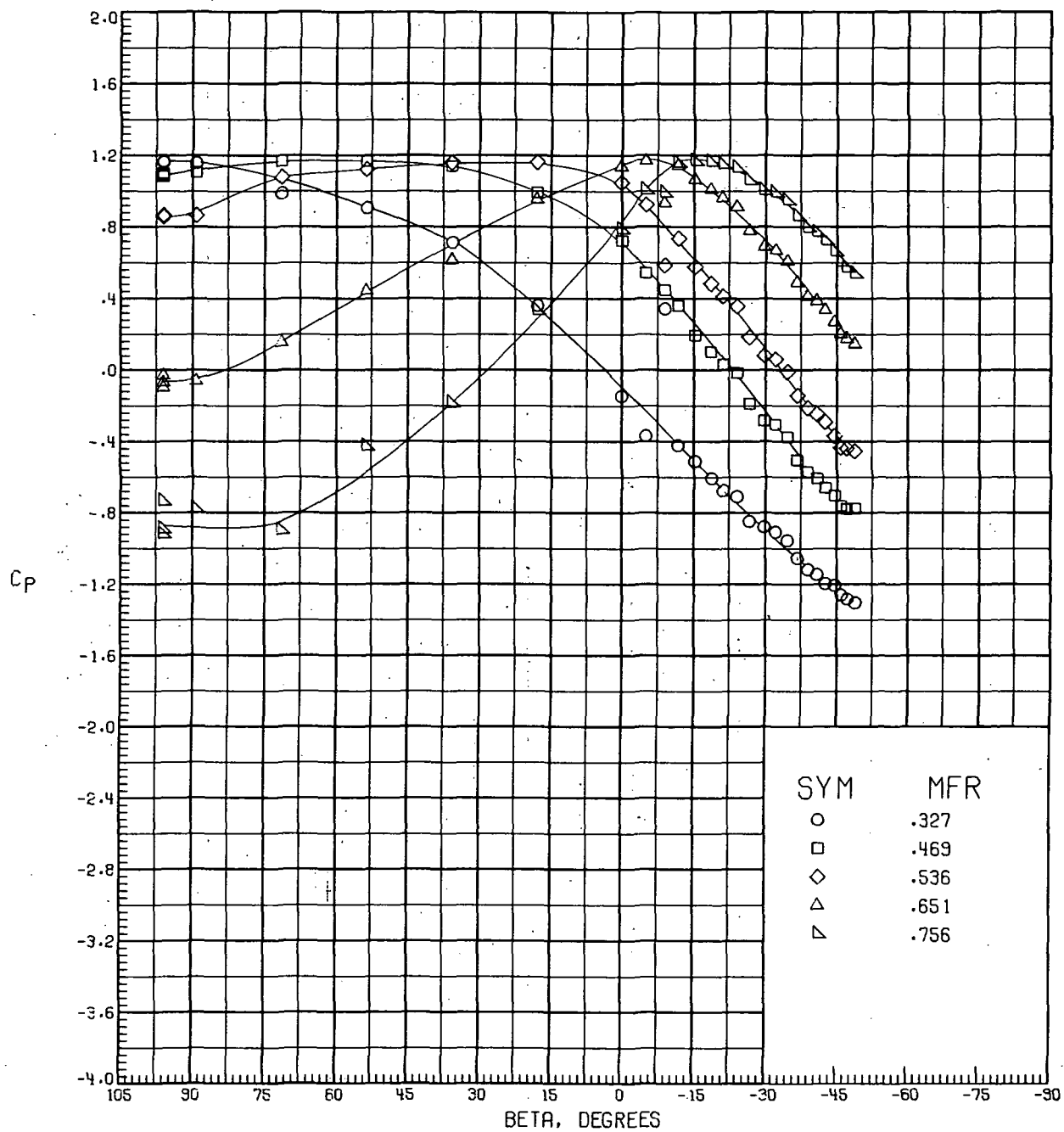
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 24. - Continued.



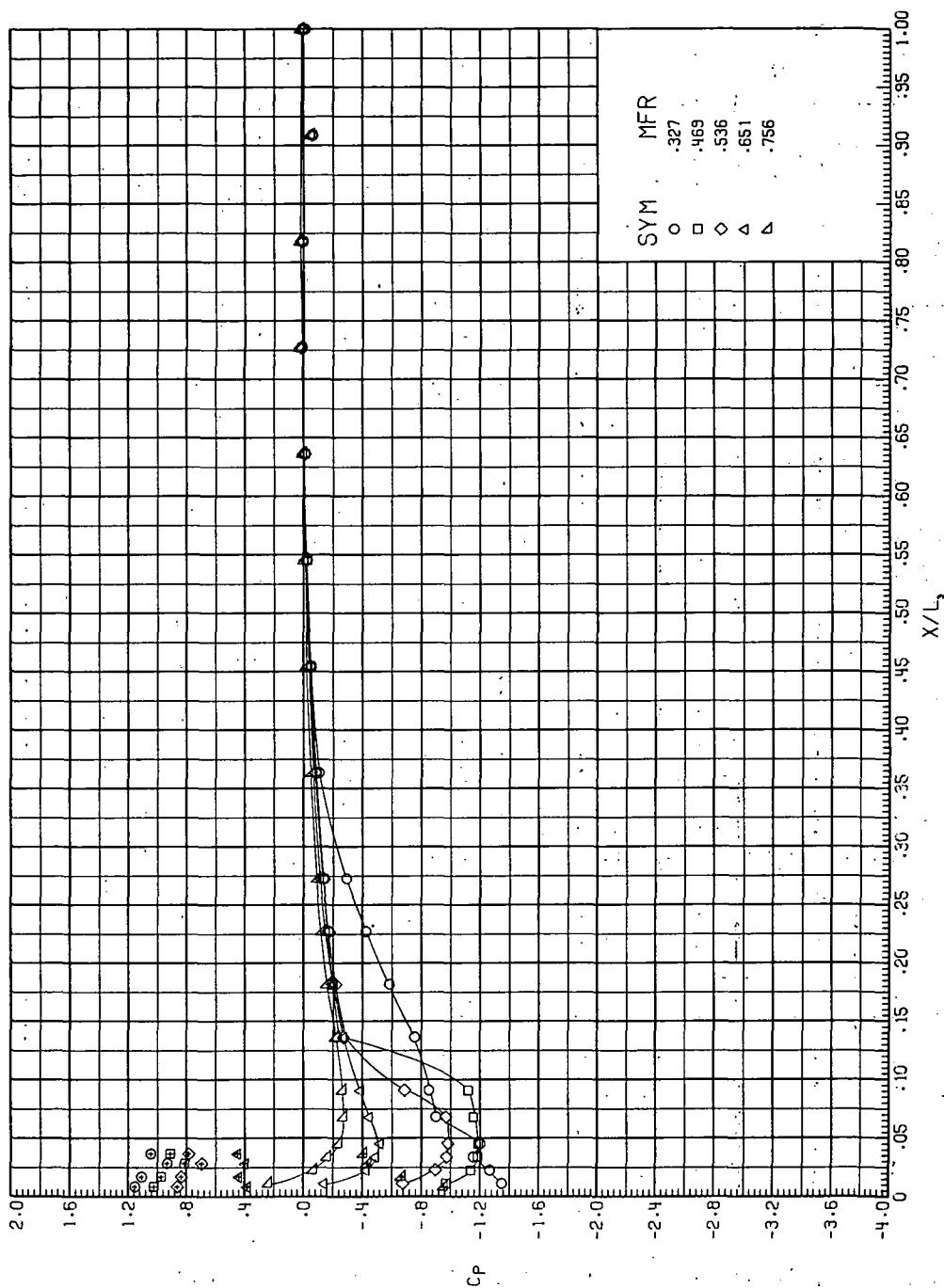
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 24.- Continued.



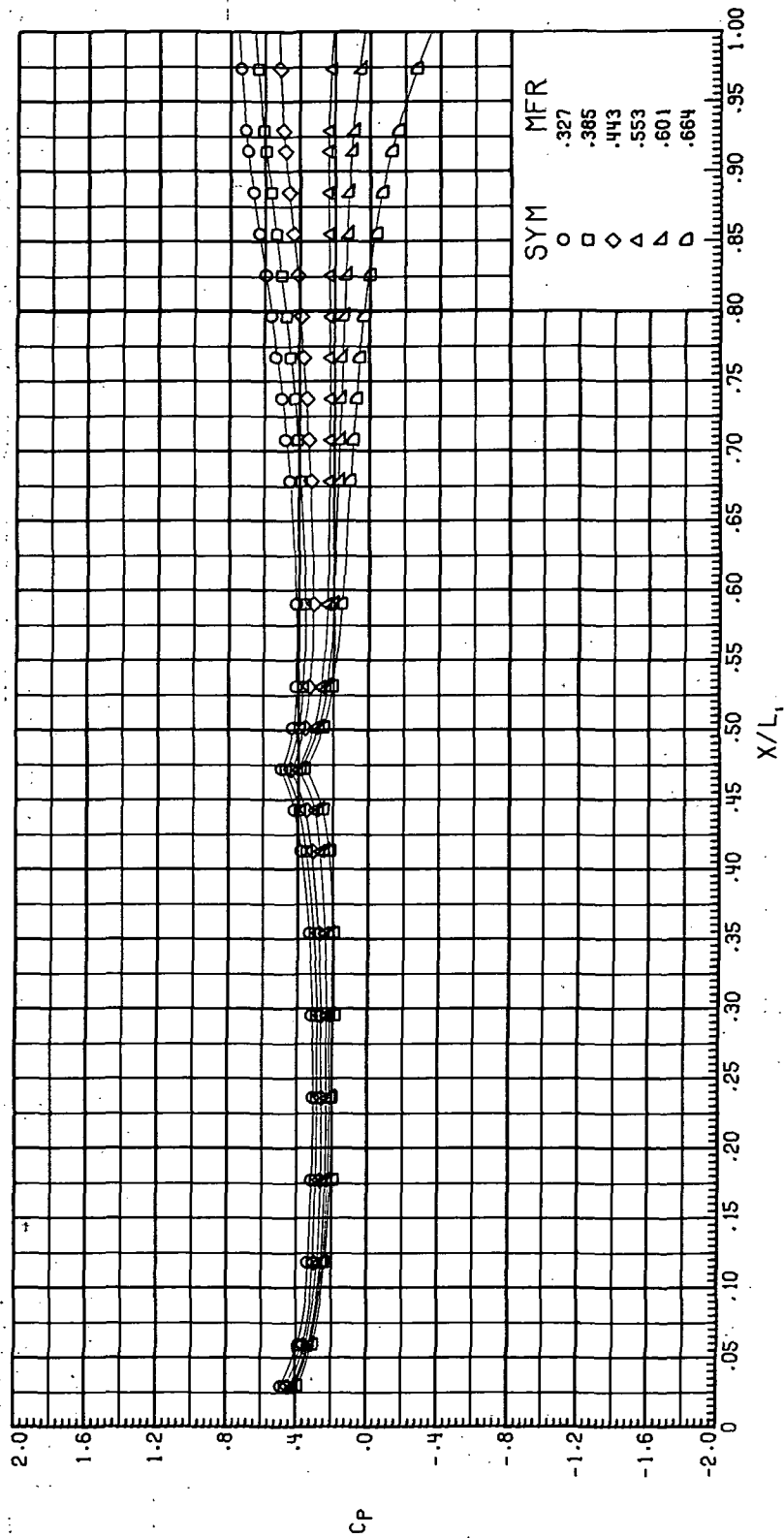
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 24.- Continued.



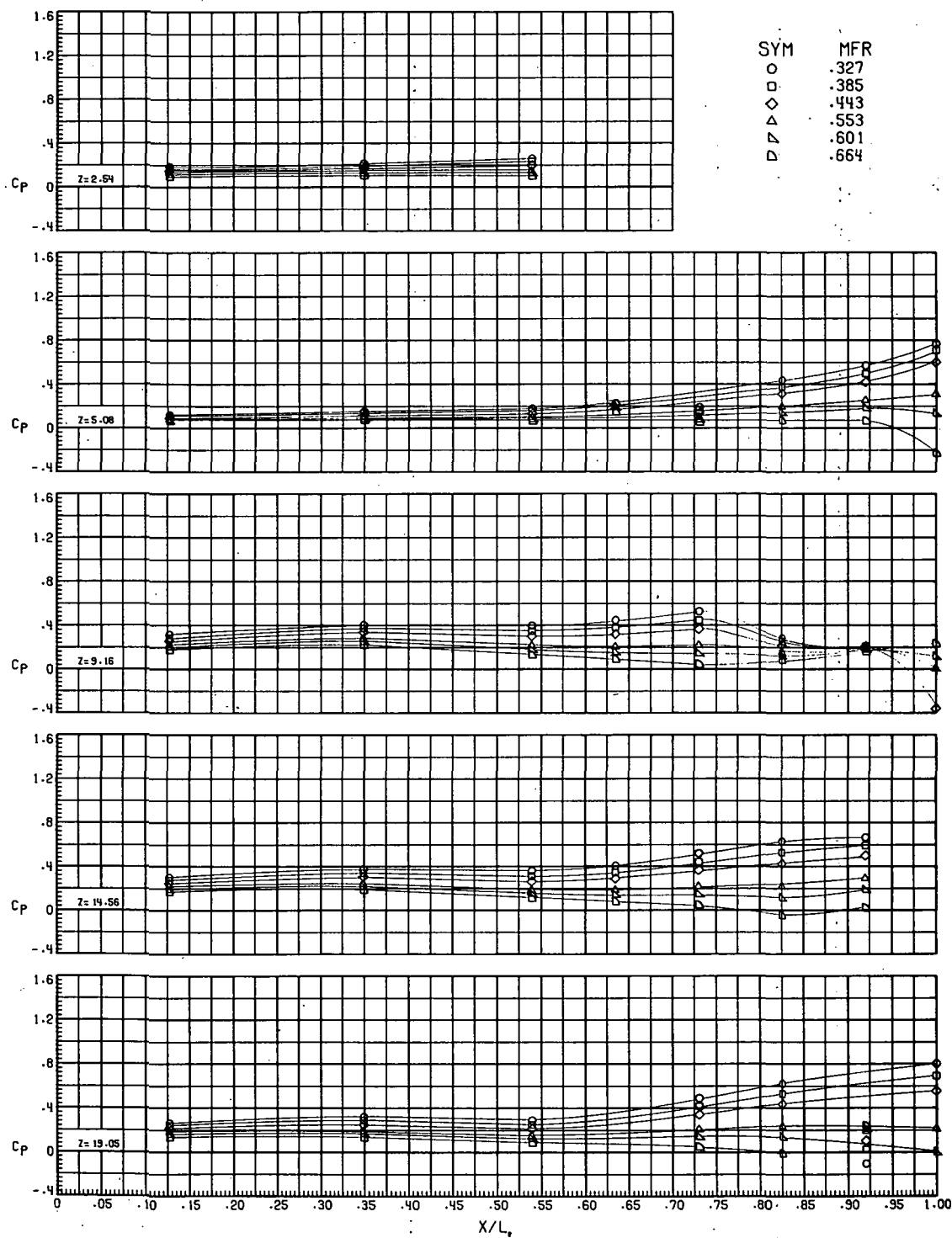
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 24.- Concluded.



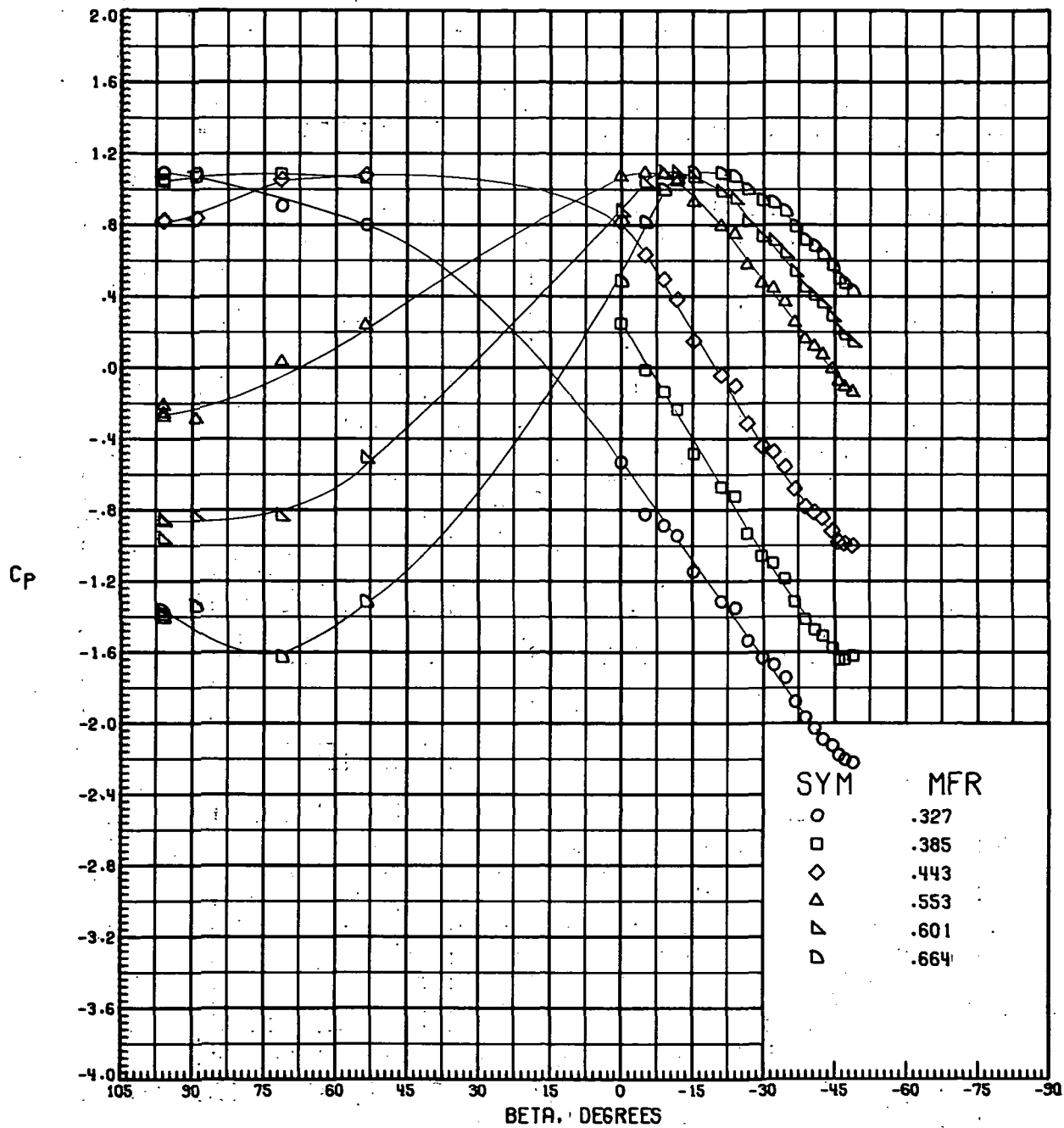
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 25.- Pressure coefficients for cowl 90-1. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



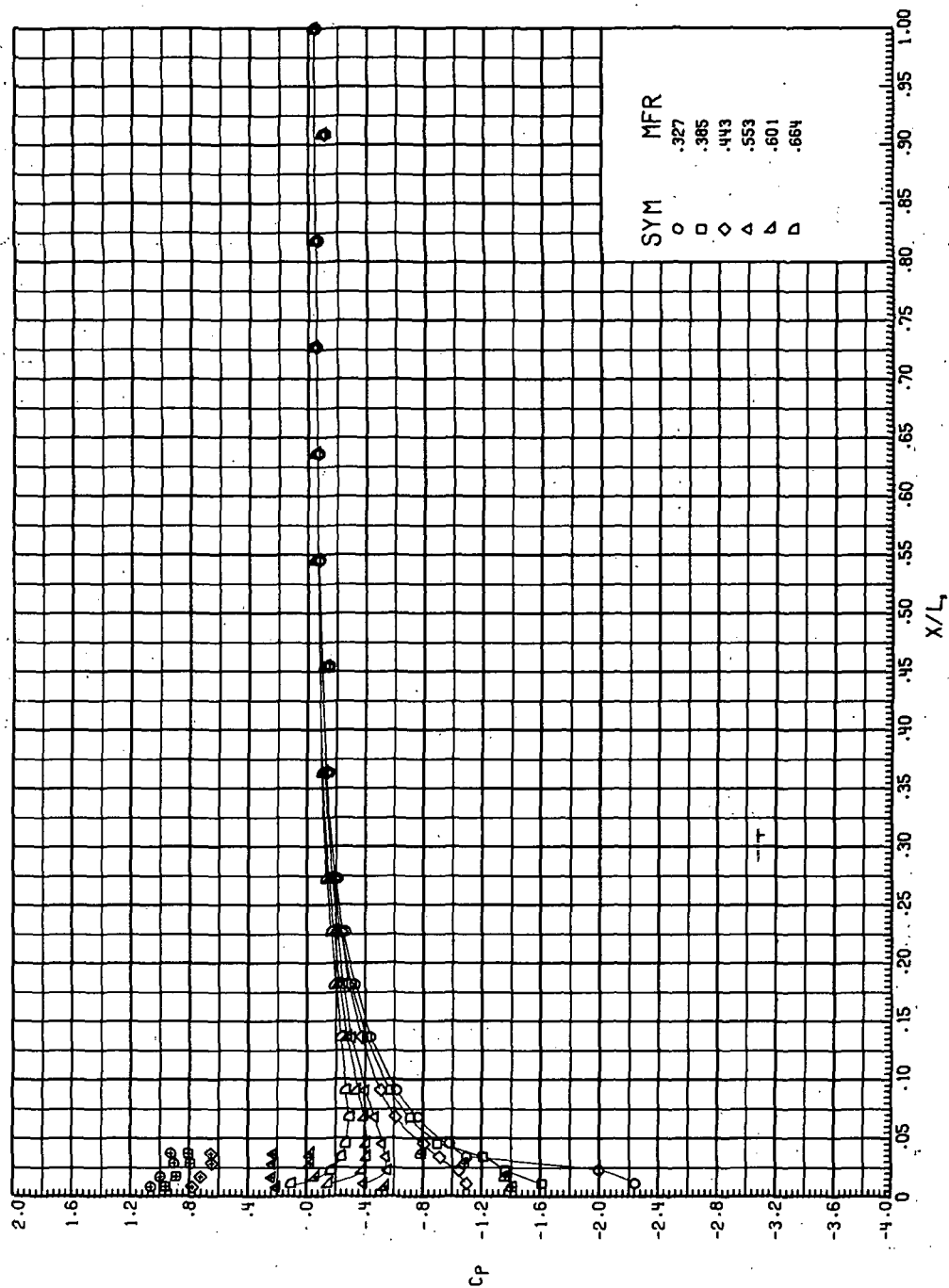
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



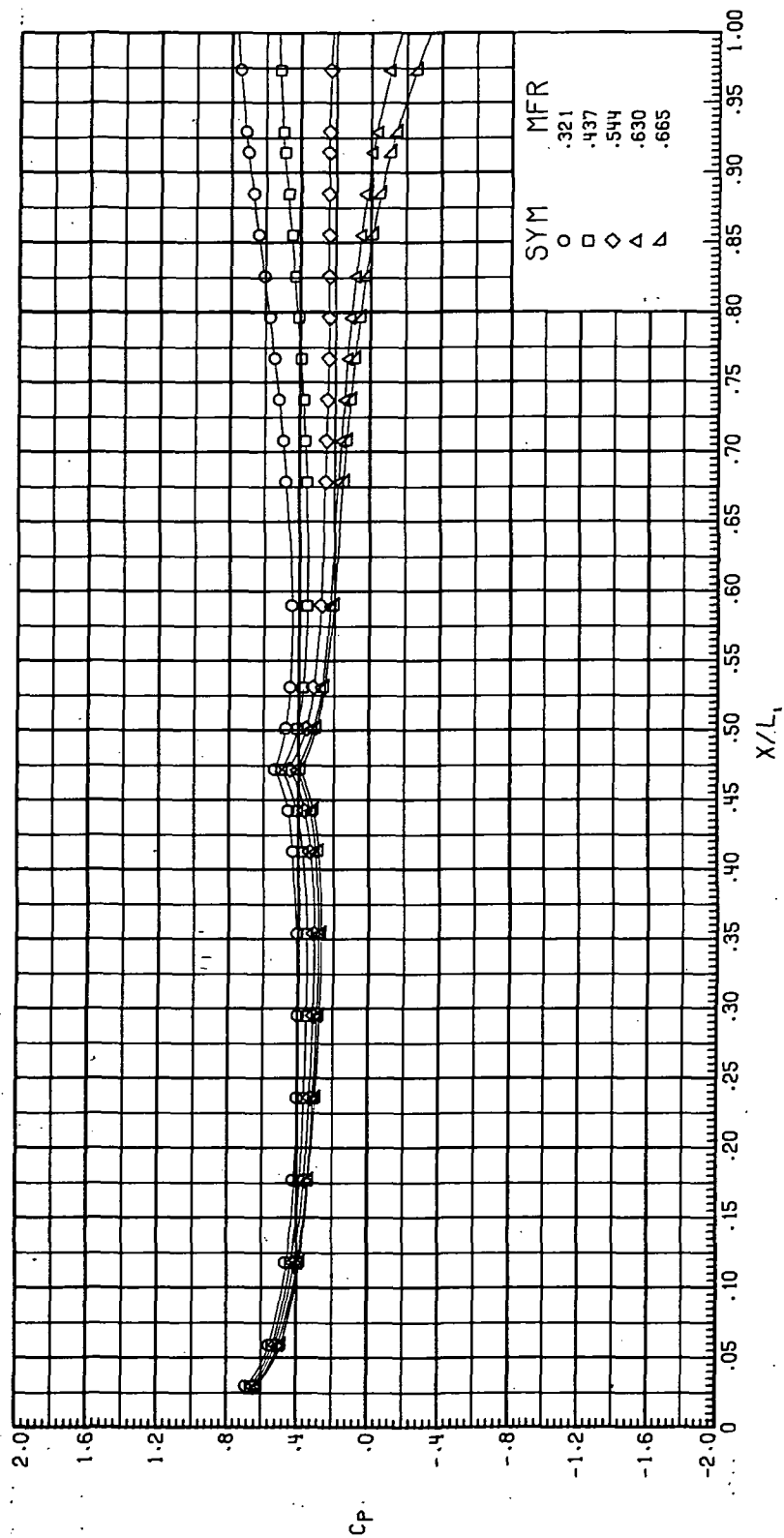
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



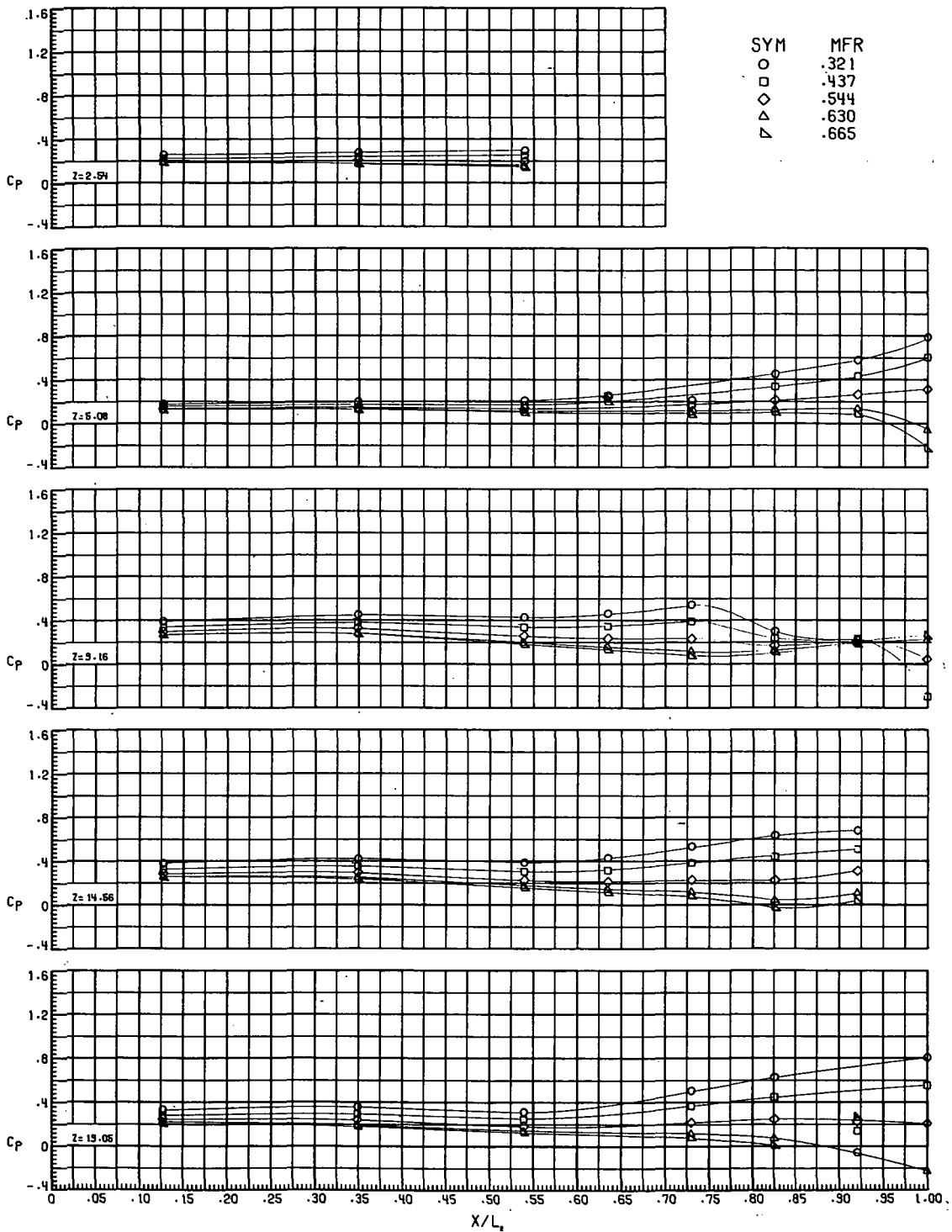
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



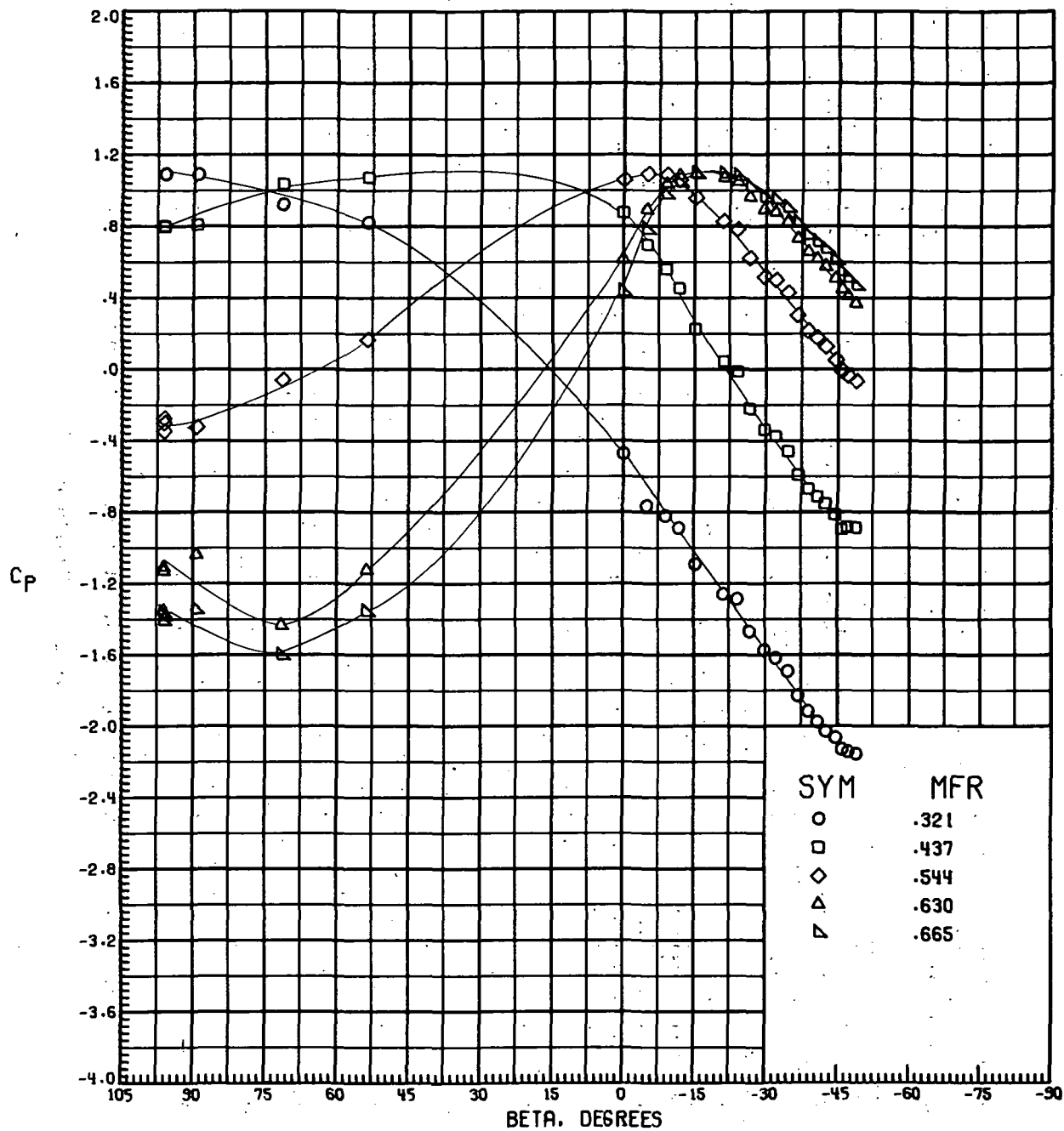
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 25. - Continued.



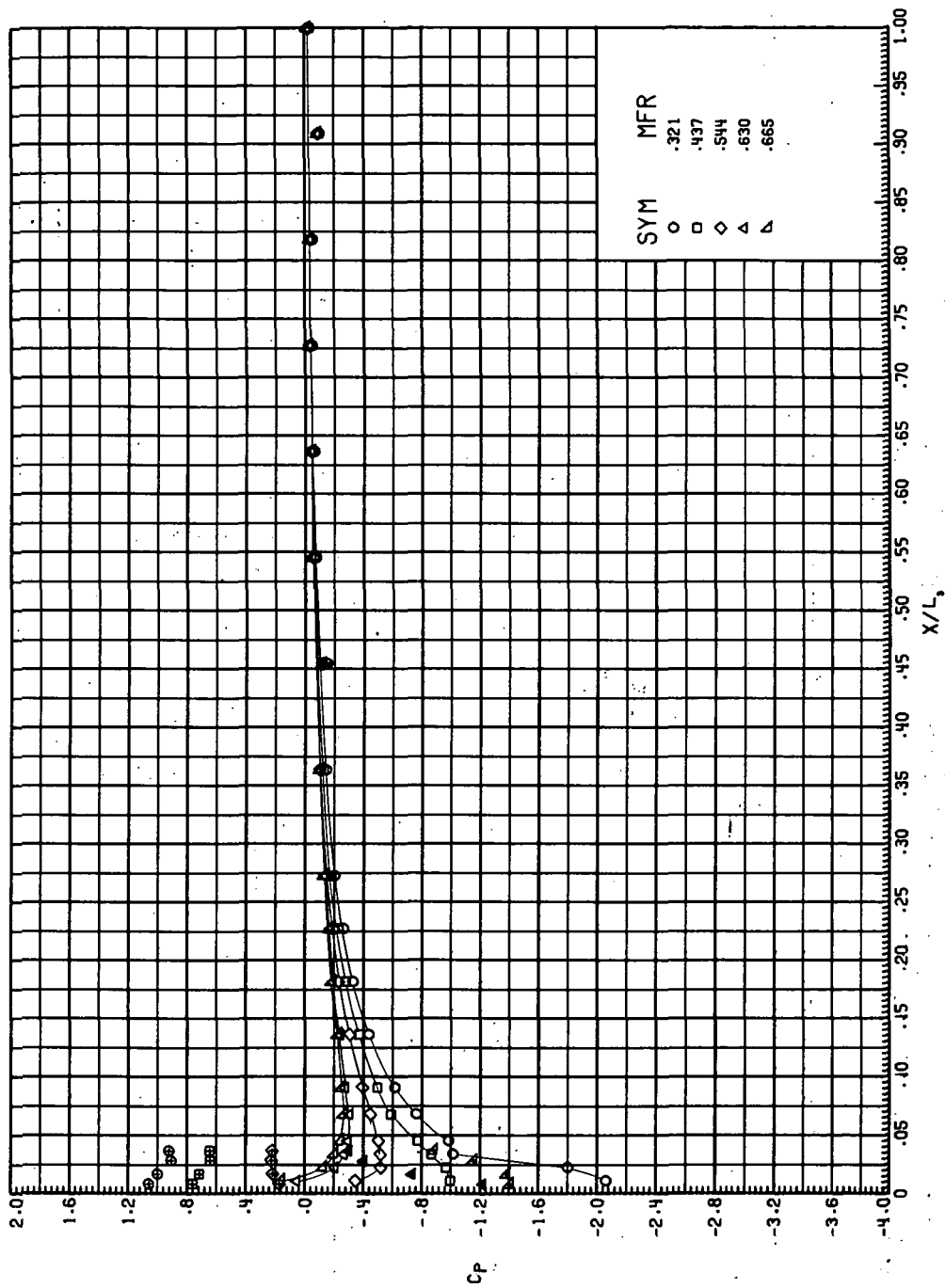
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



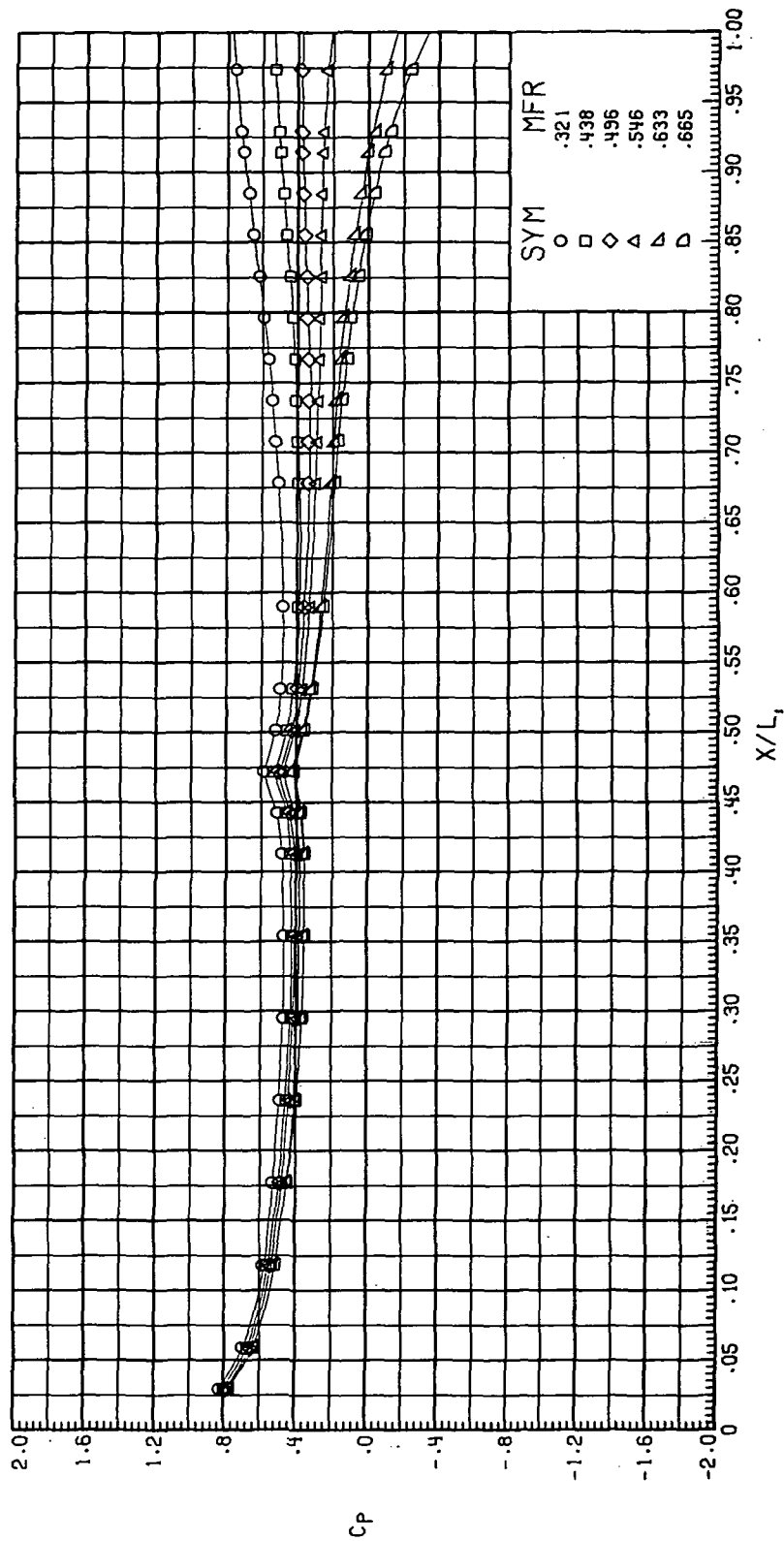
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



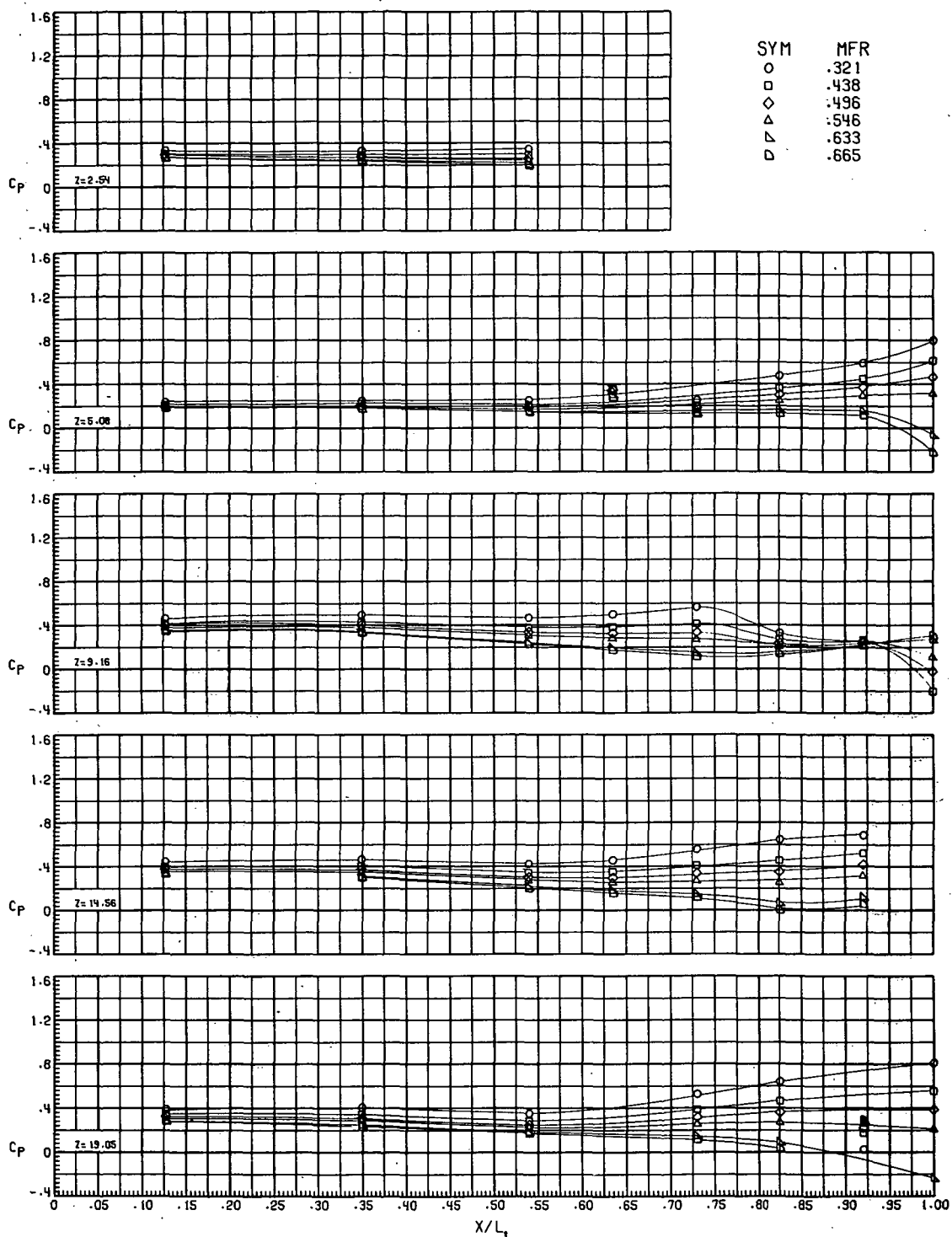
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



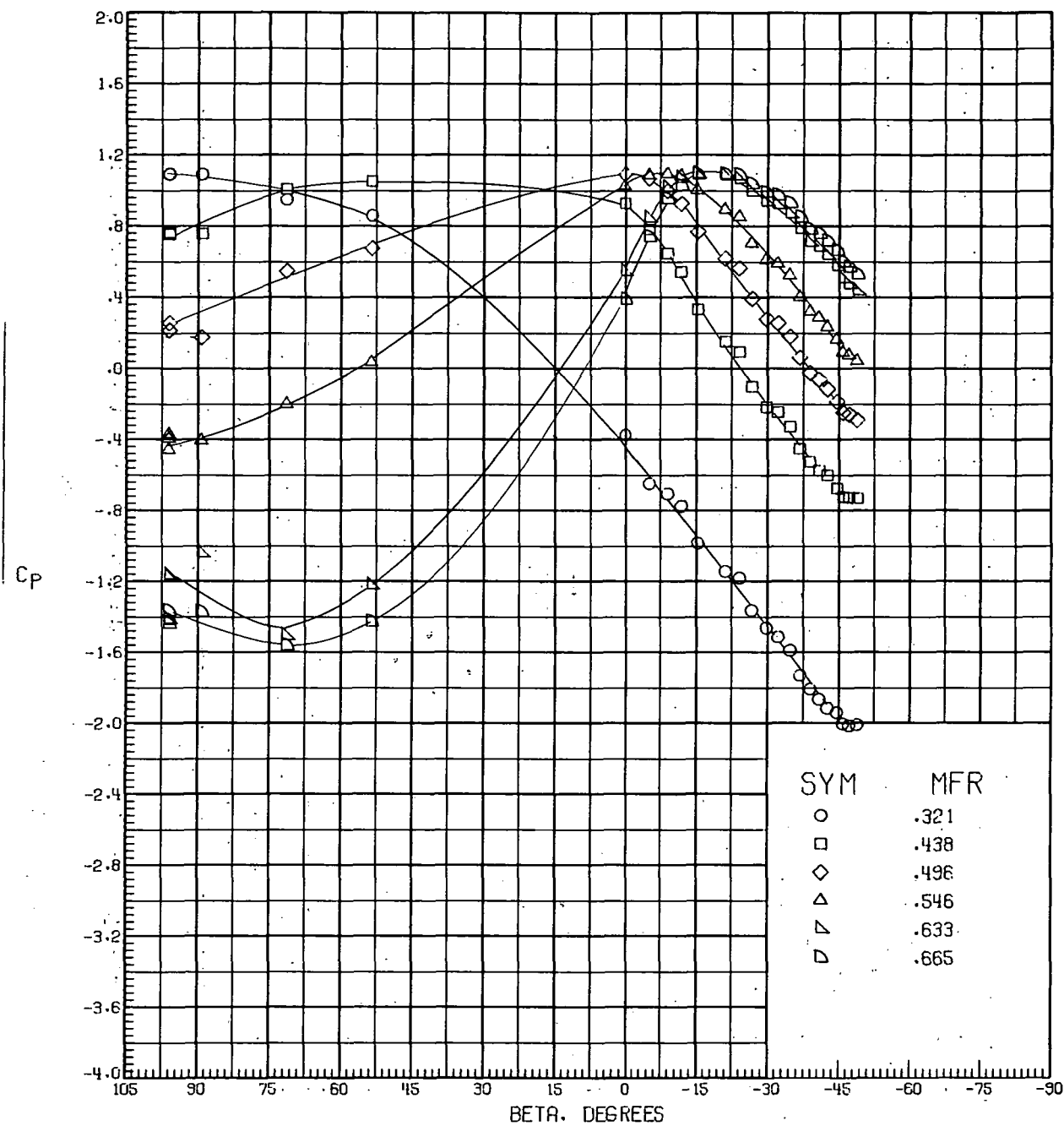
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 25.- Continued.



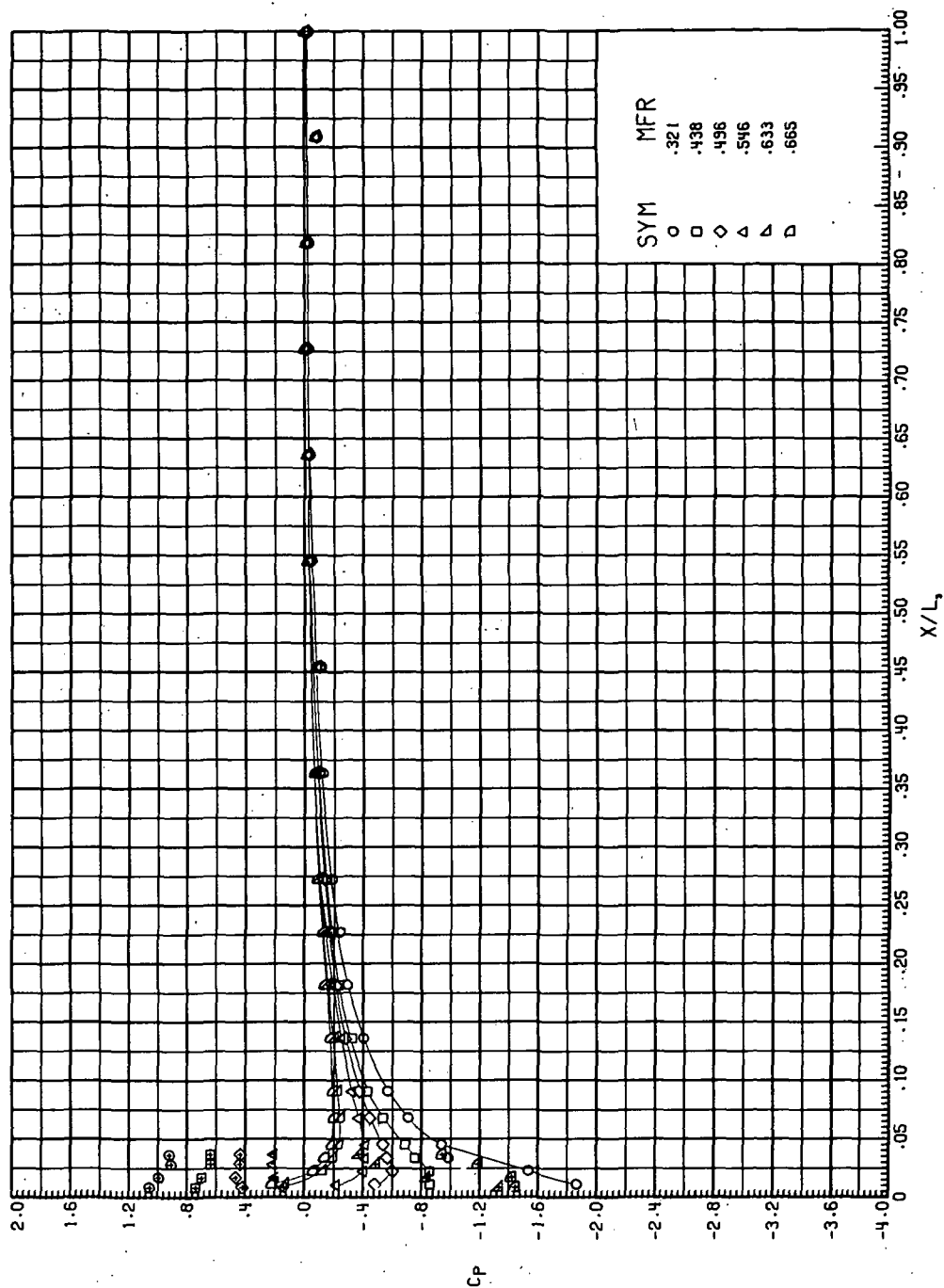
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



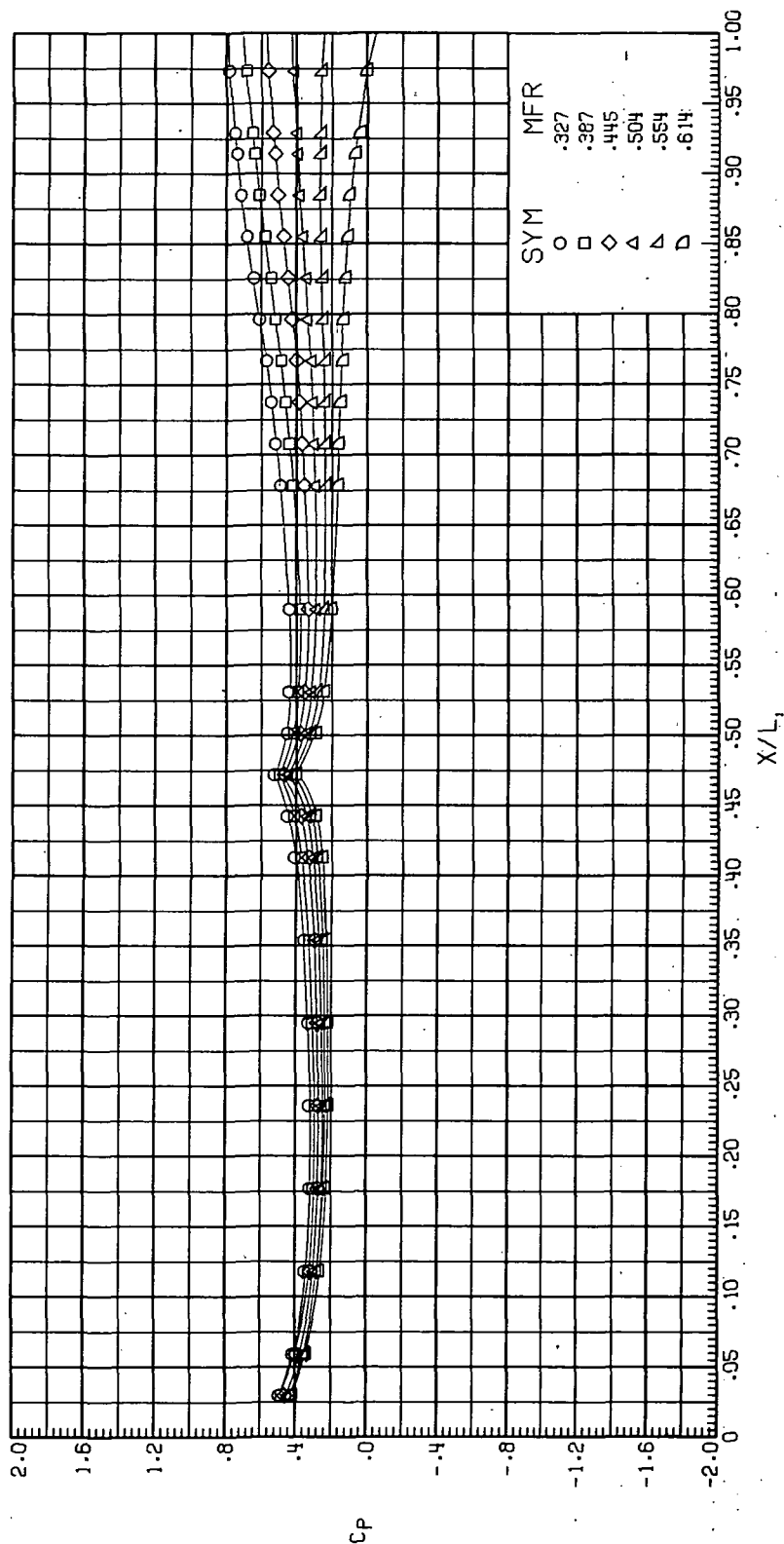
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



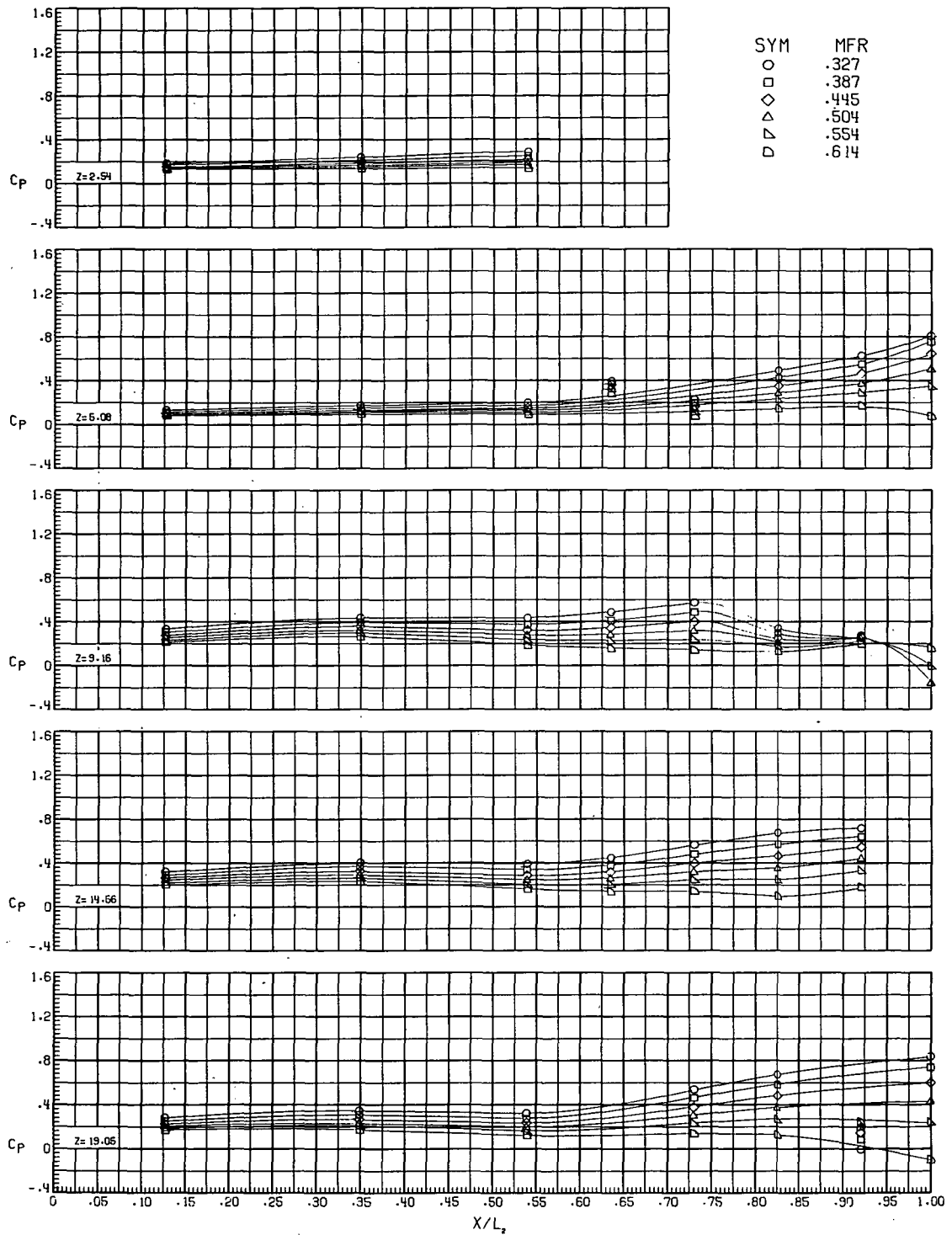
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



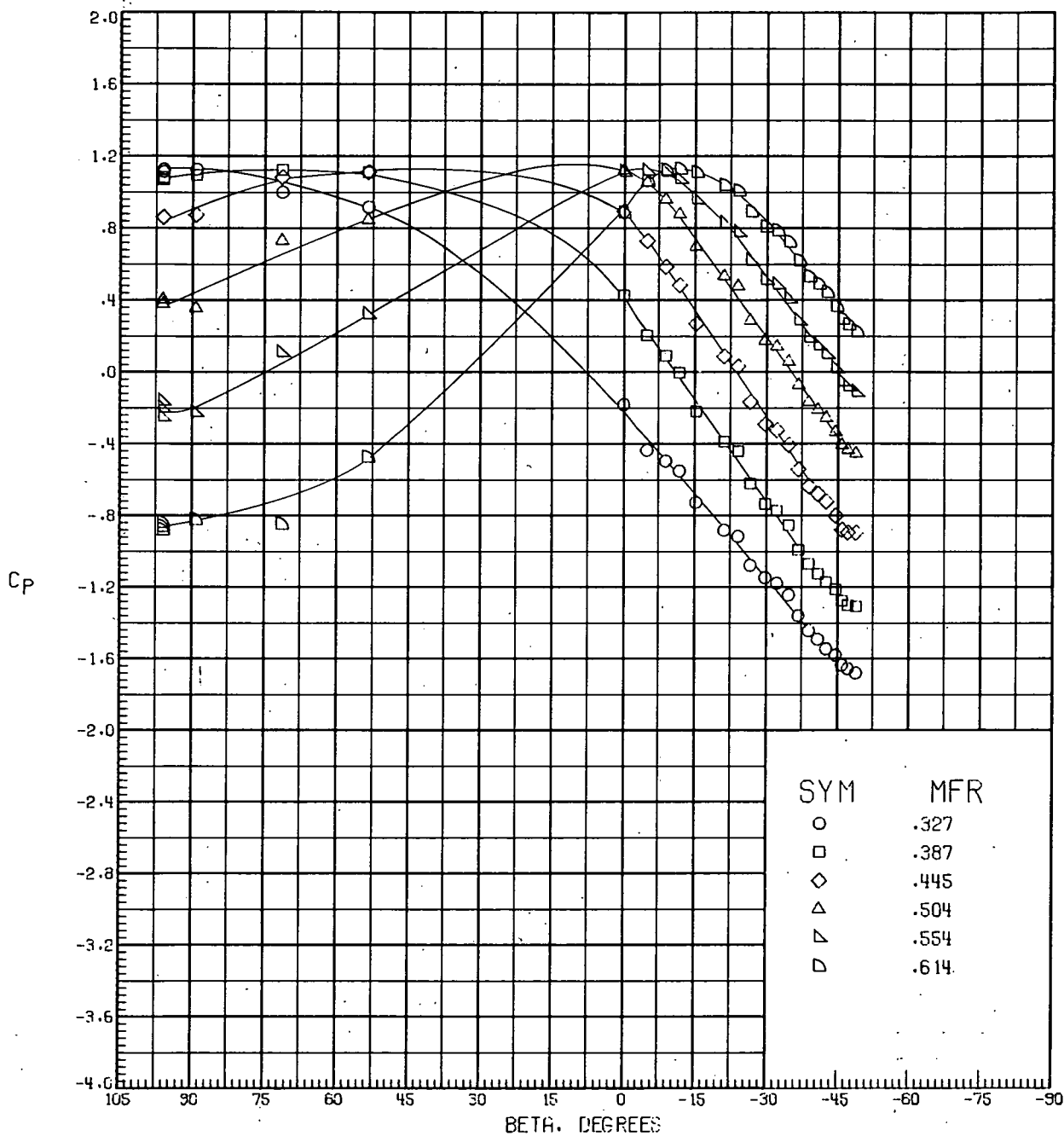
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 25.-- Continued.



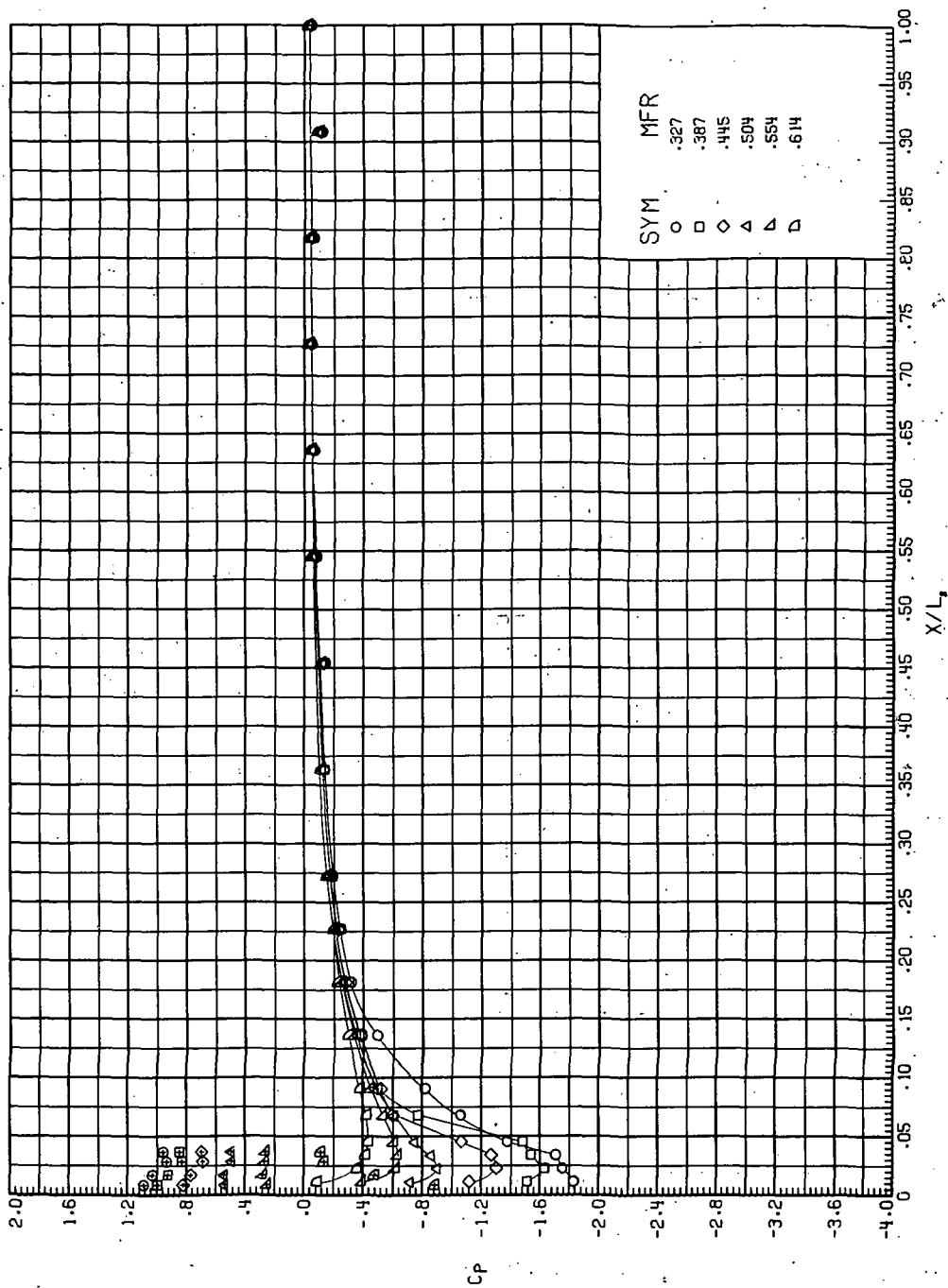
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



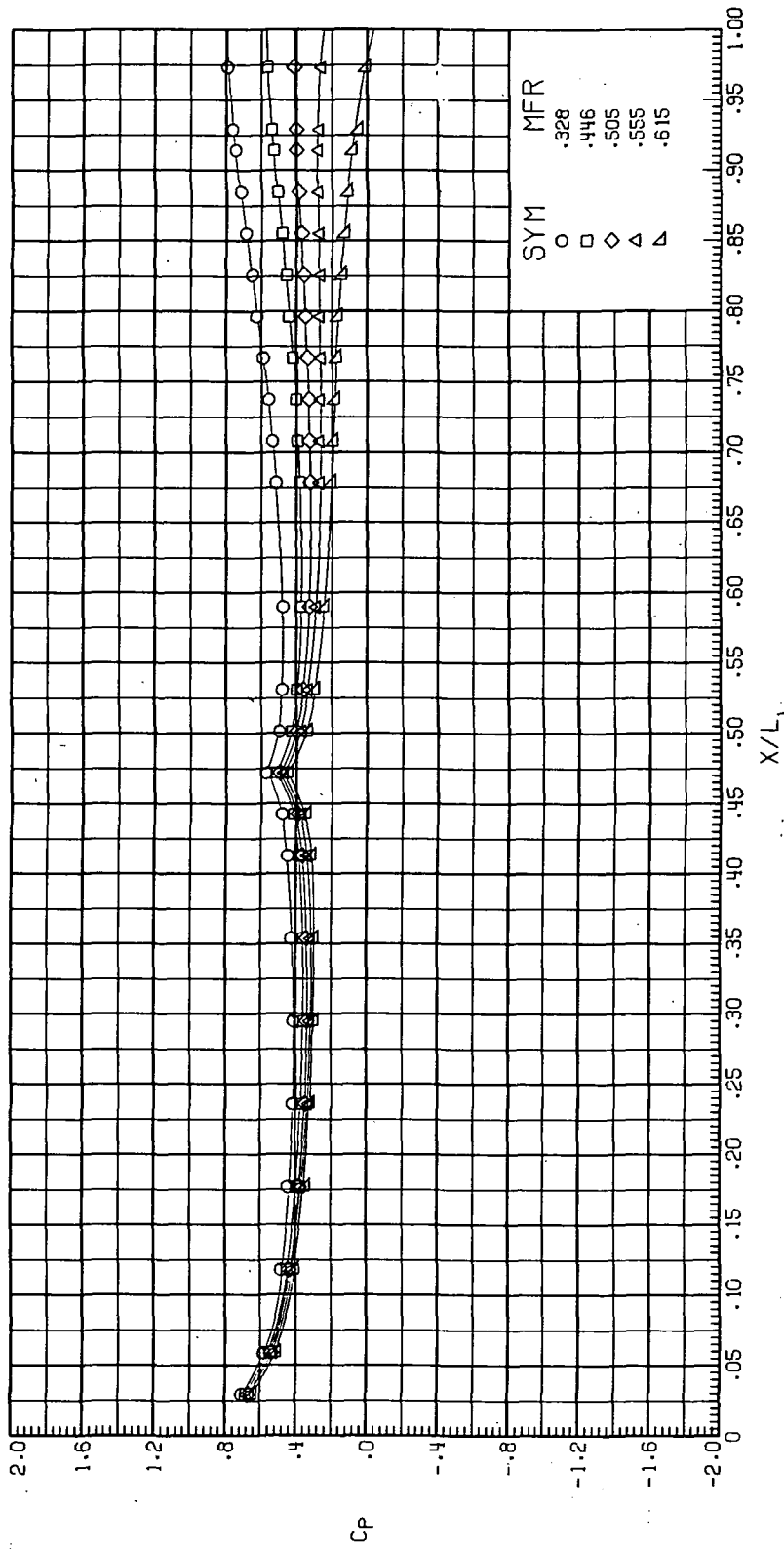
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



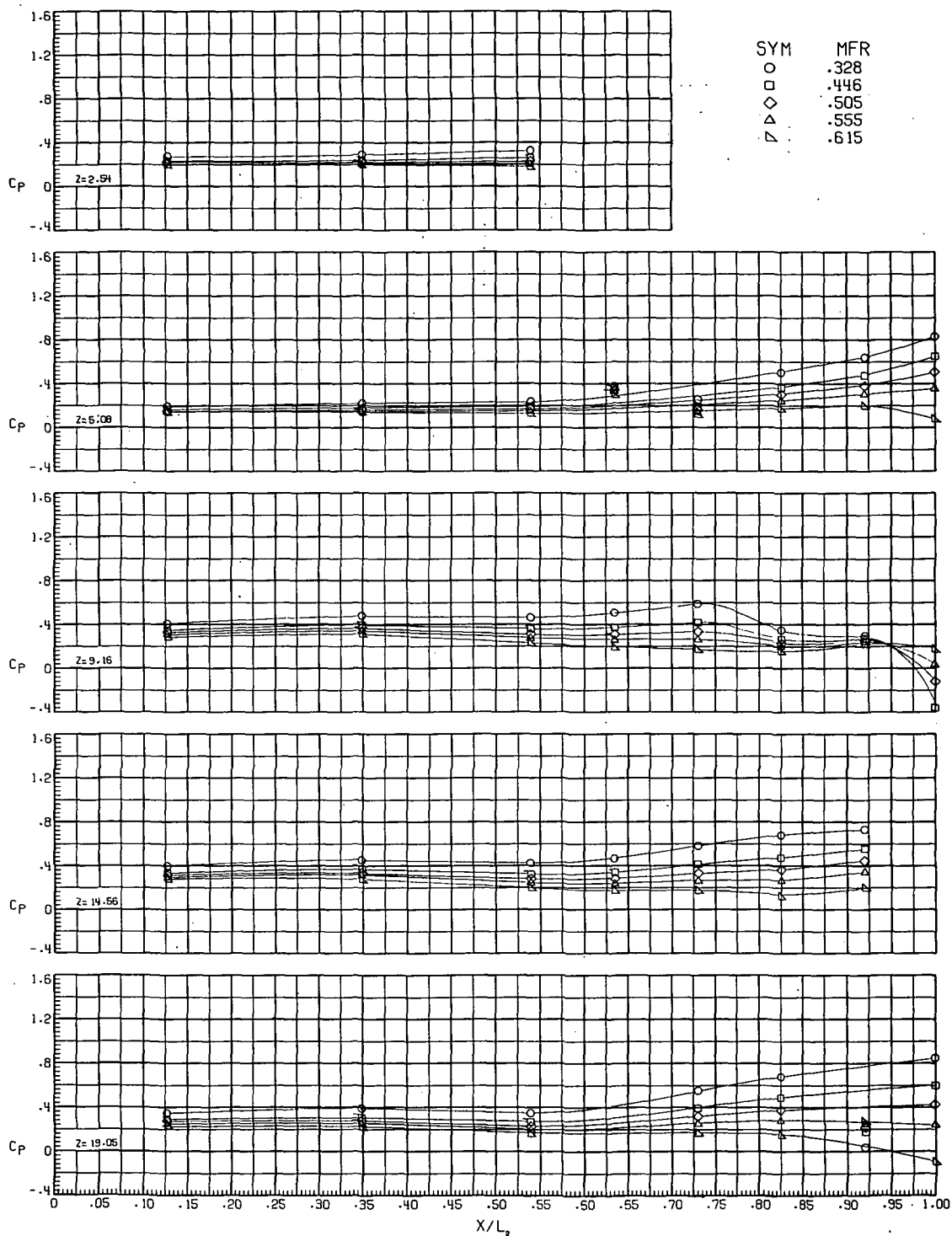
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



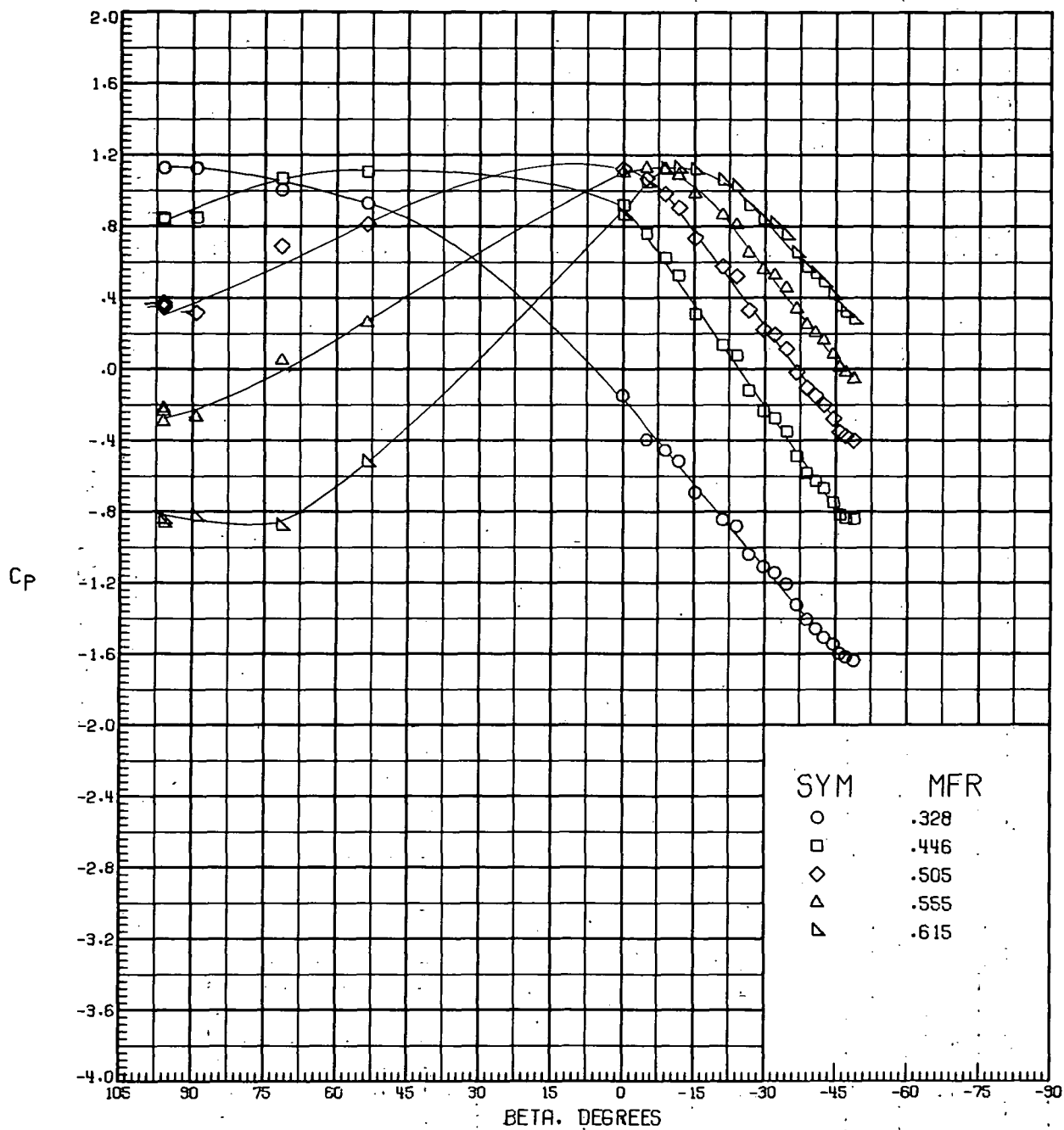
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 25.- Continued.



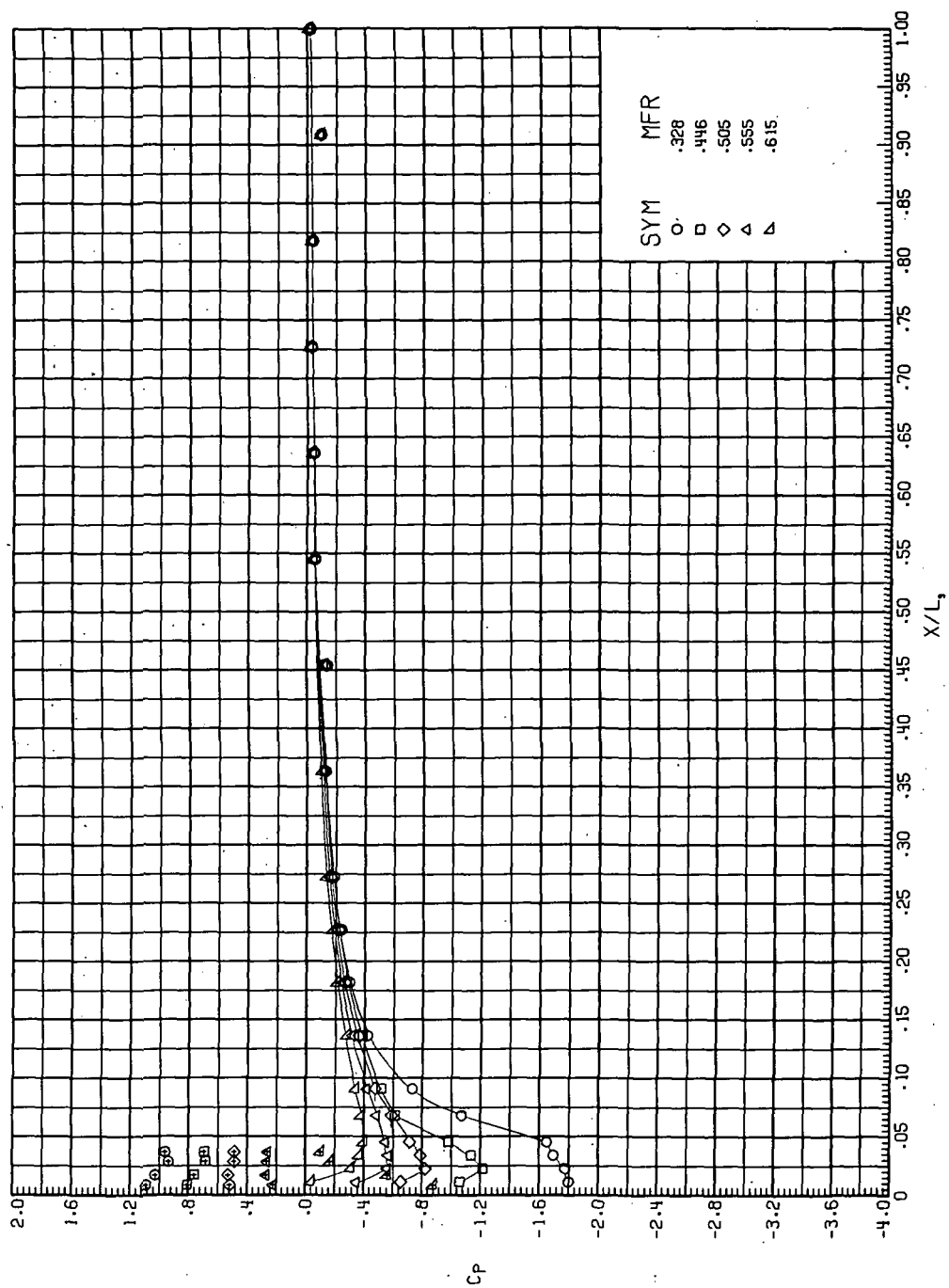
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



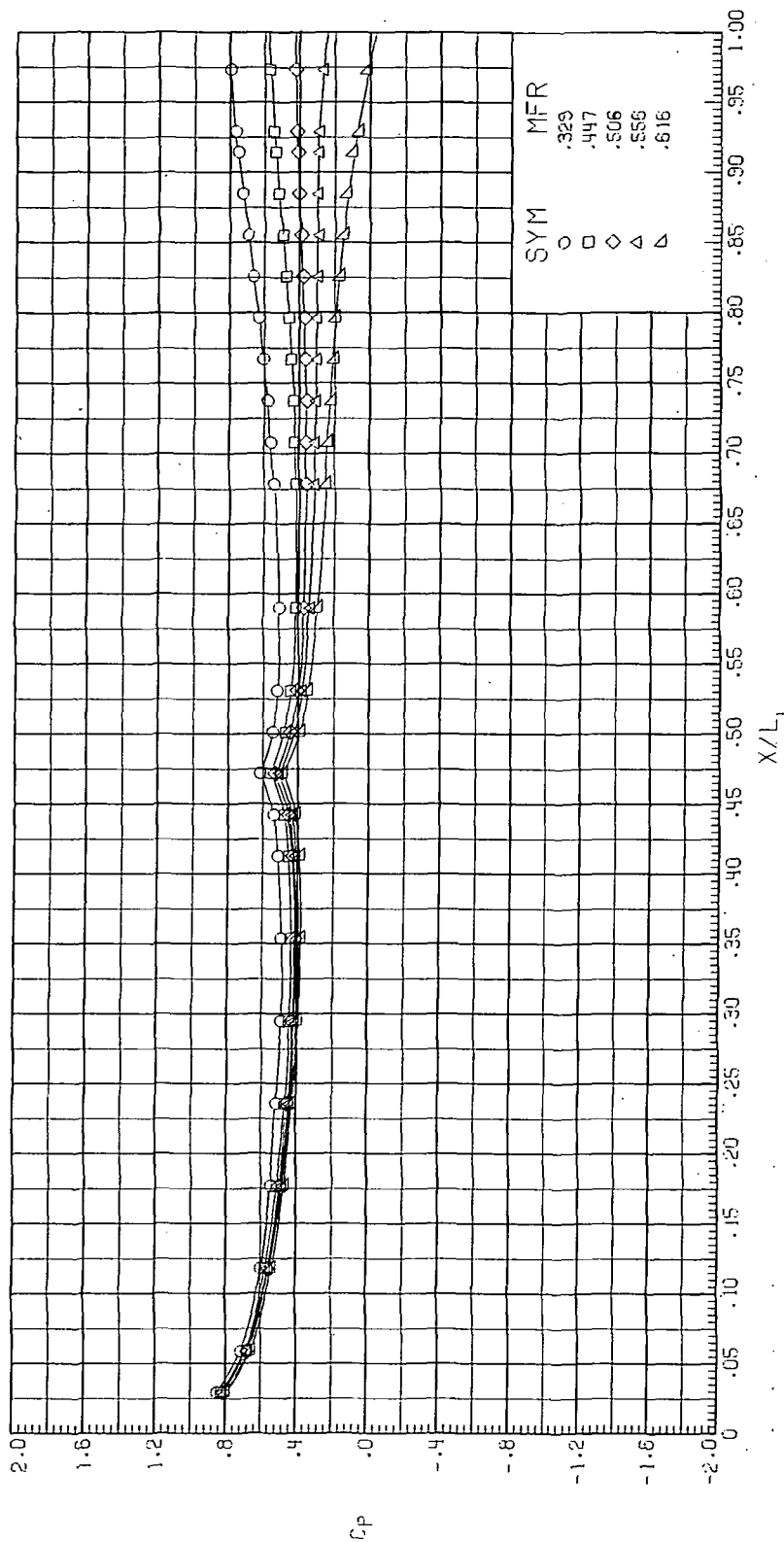
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



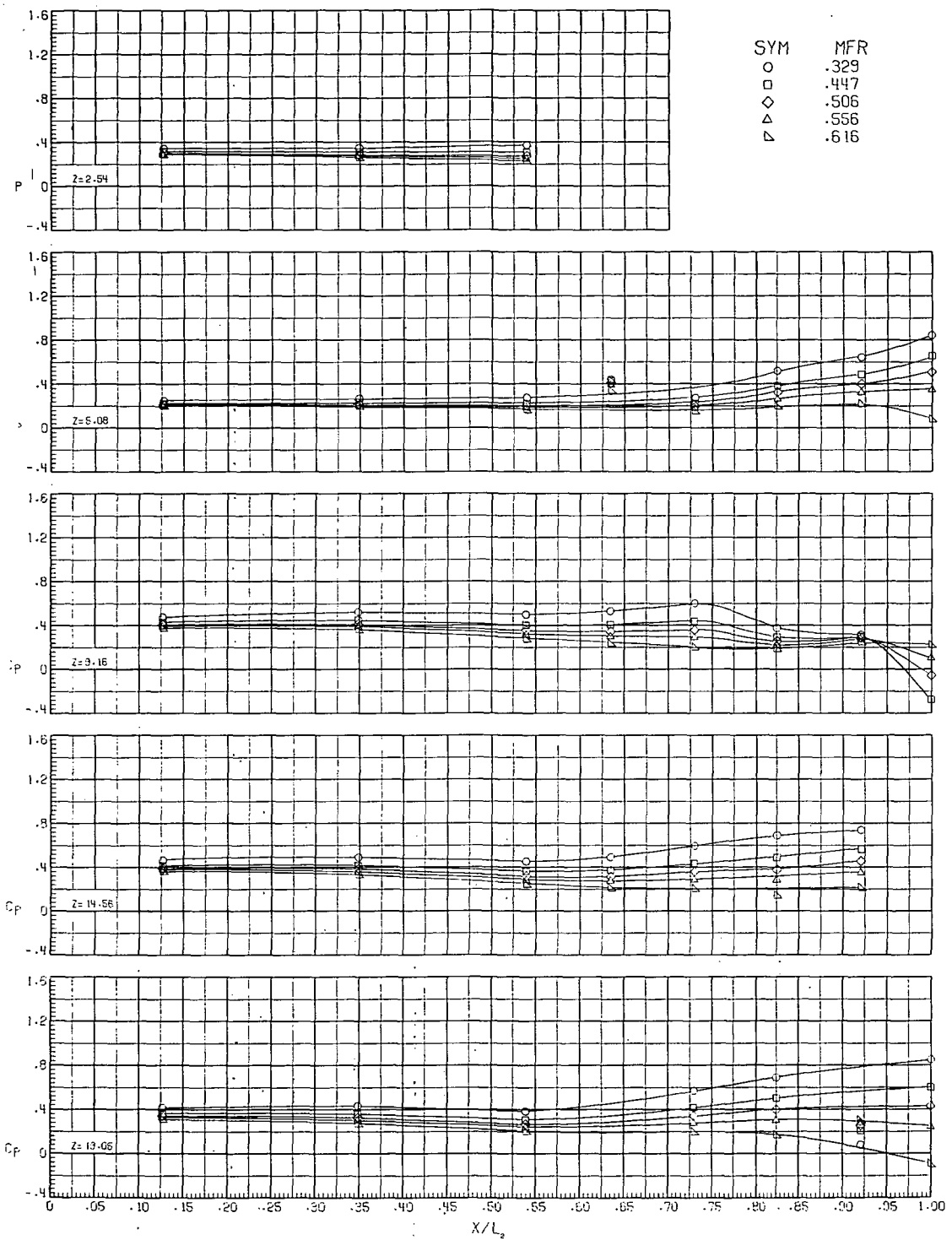
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



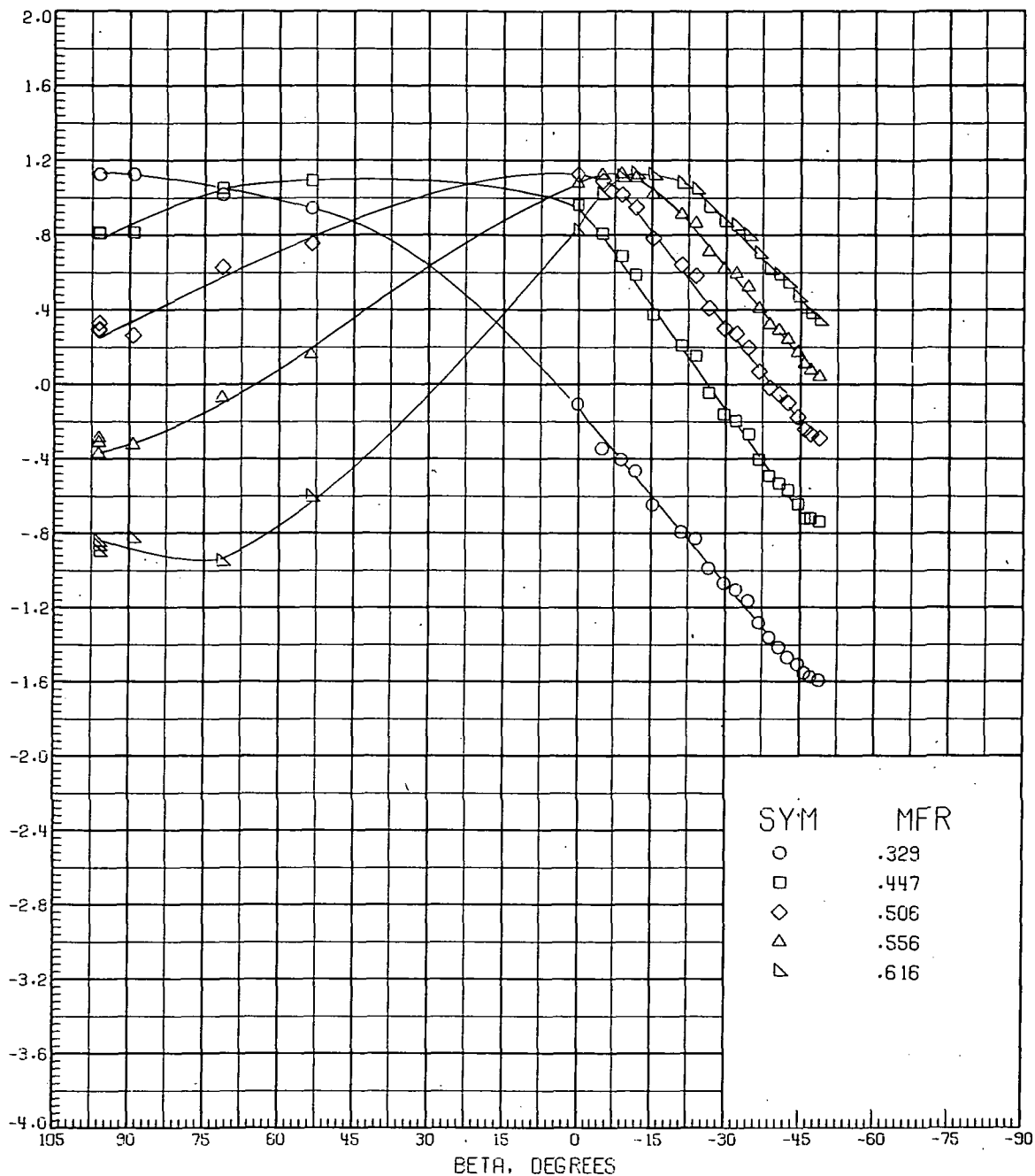
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 25. - Continued.



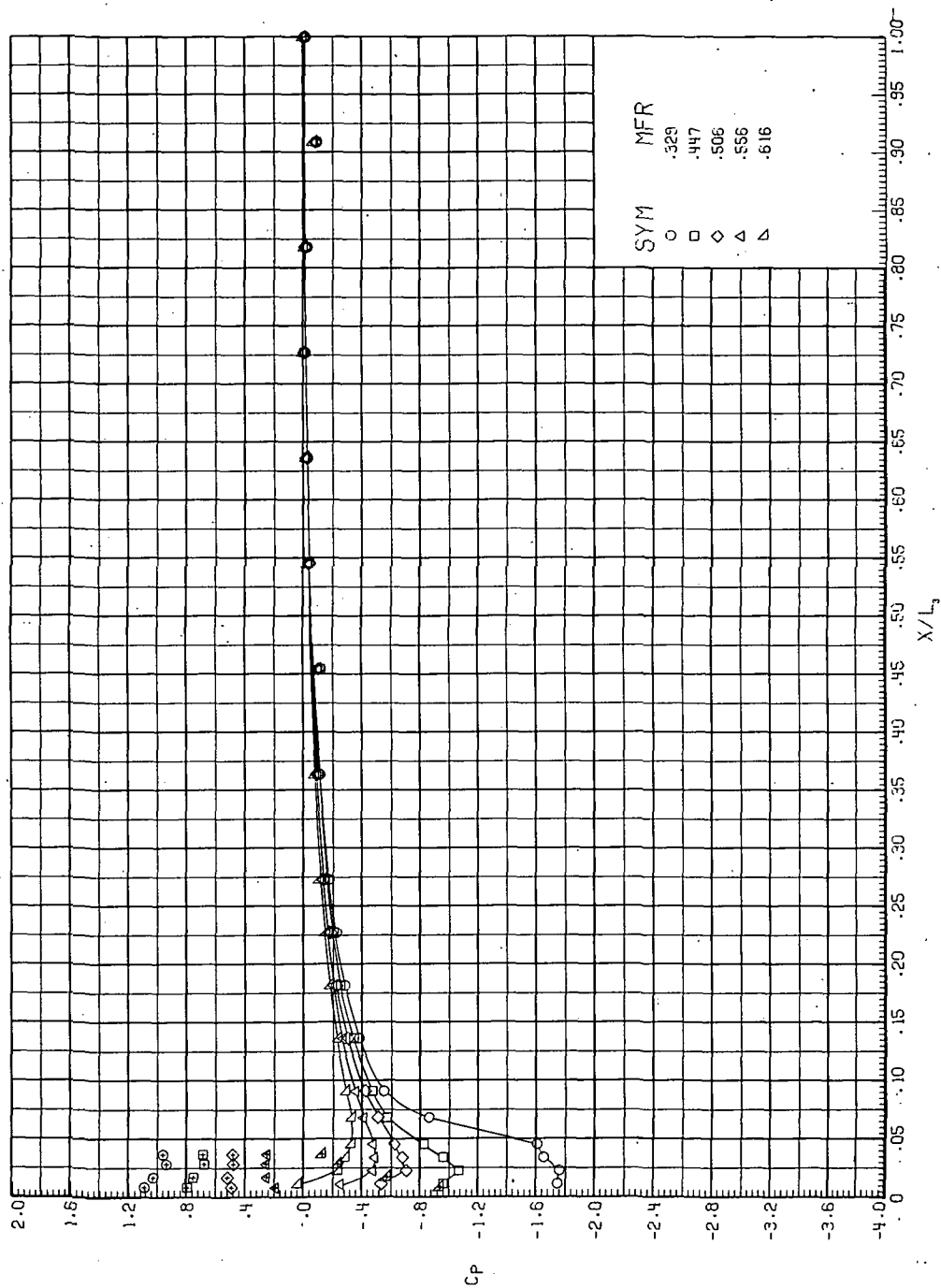
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



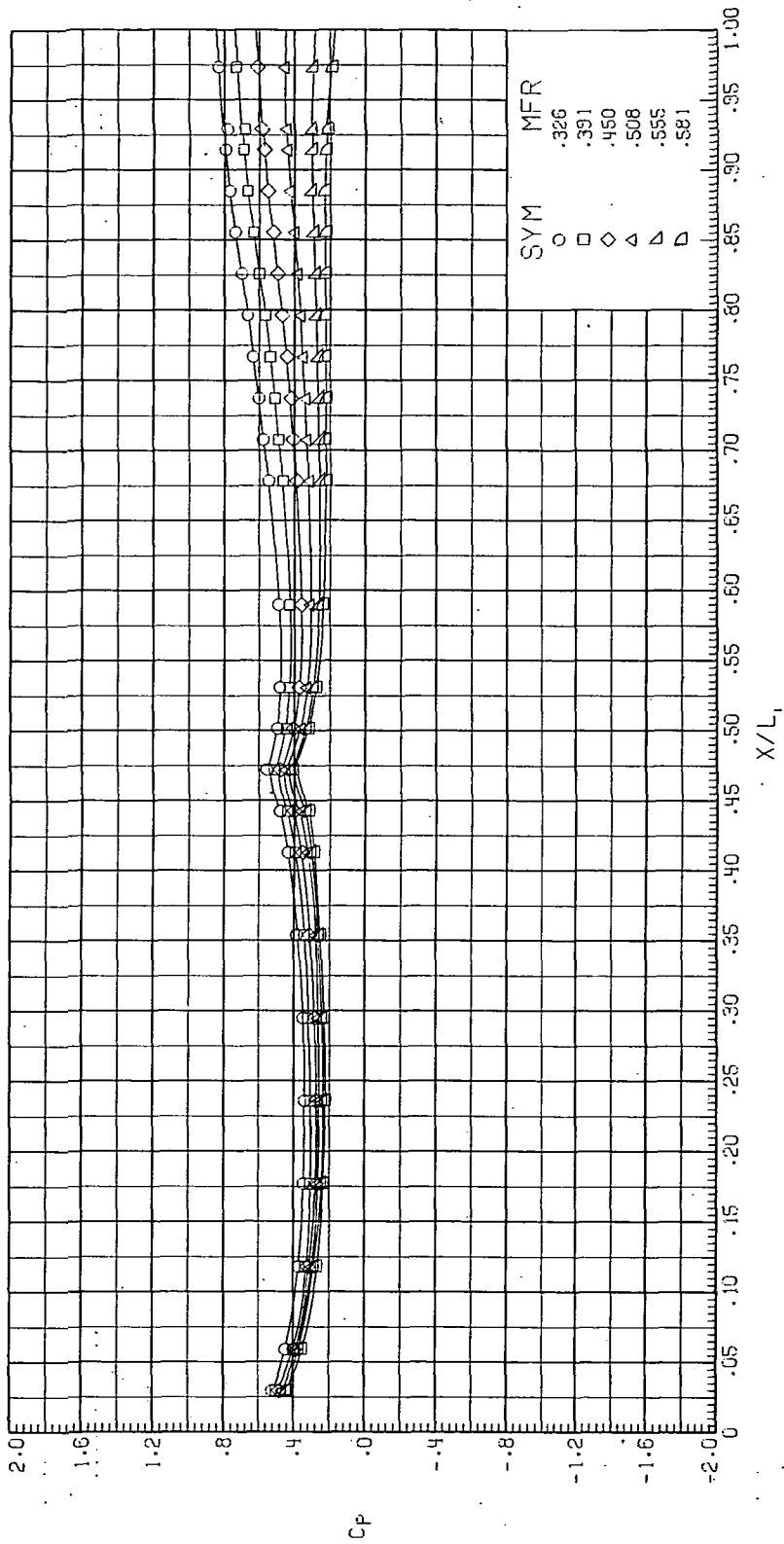
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



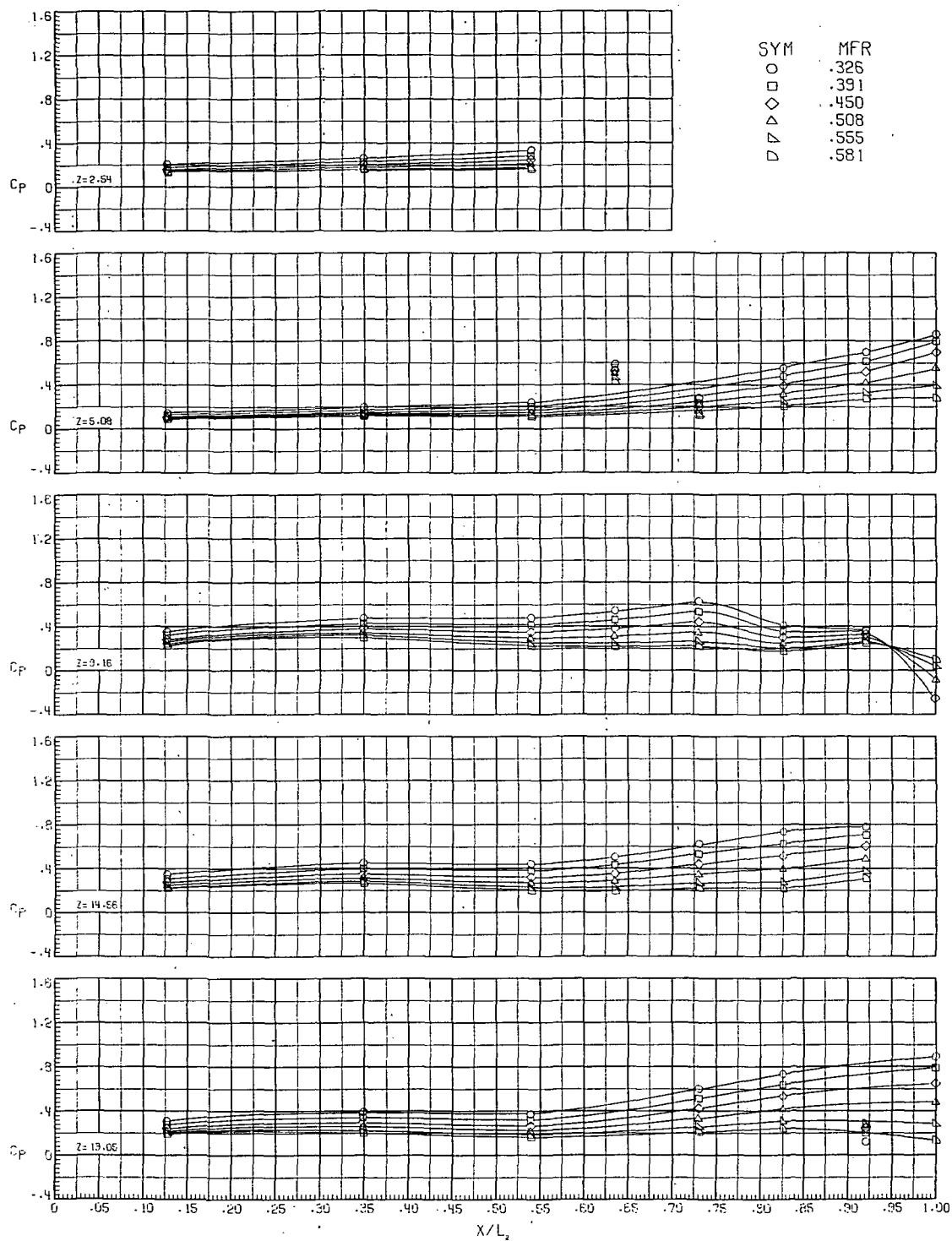
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

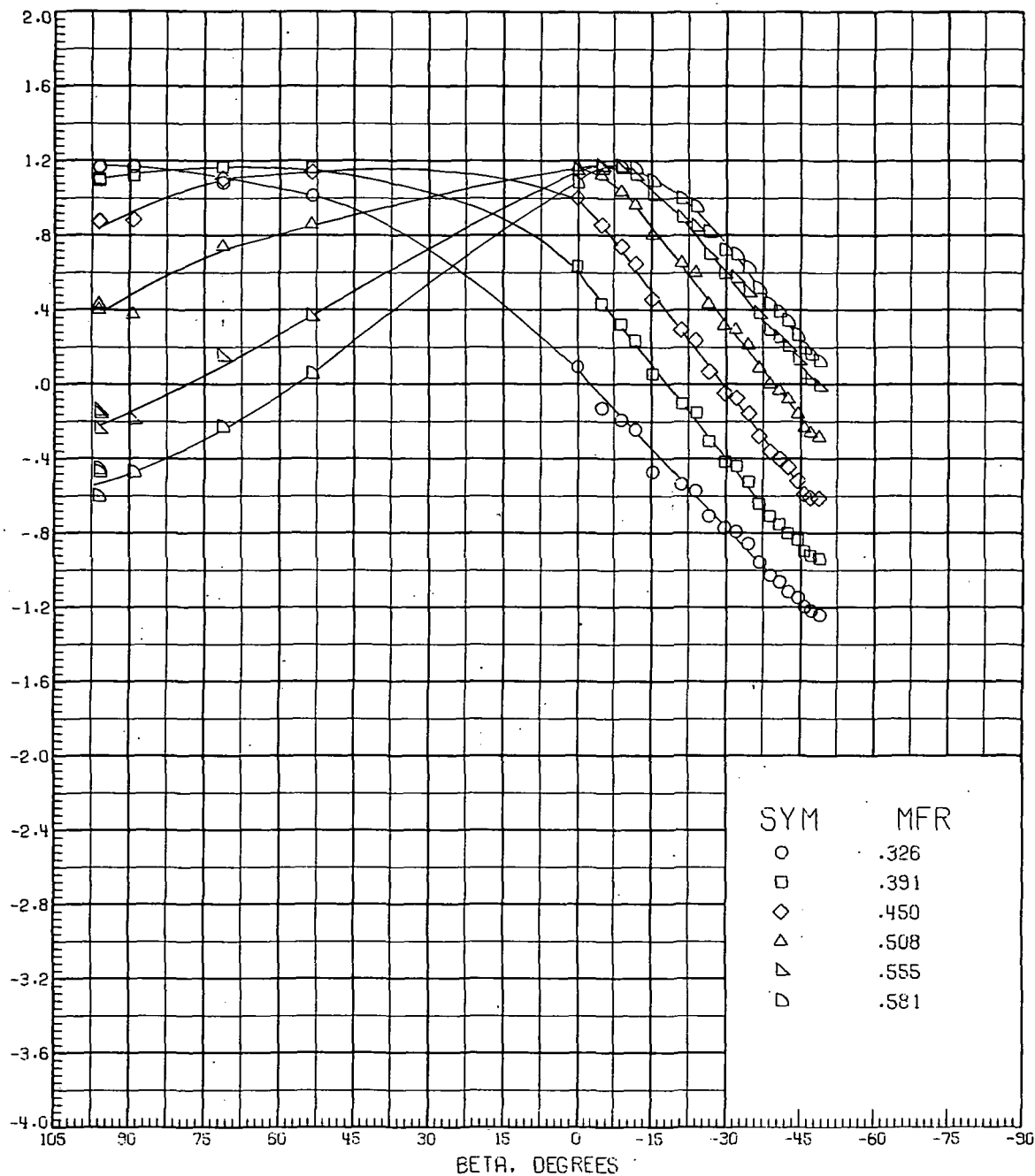
Figure 25. - Continued.



(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

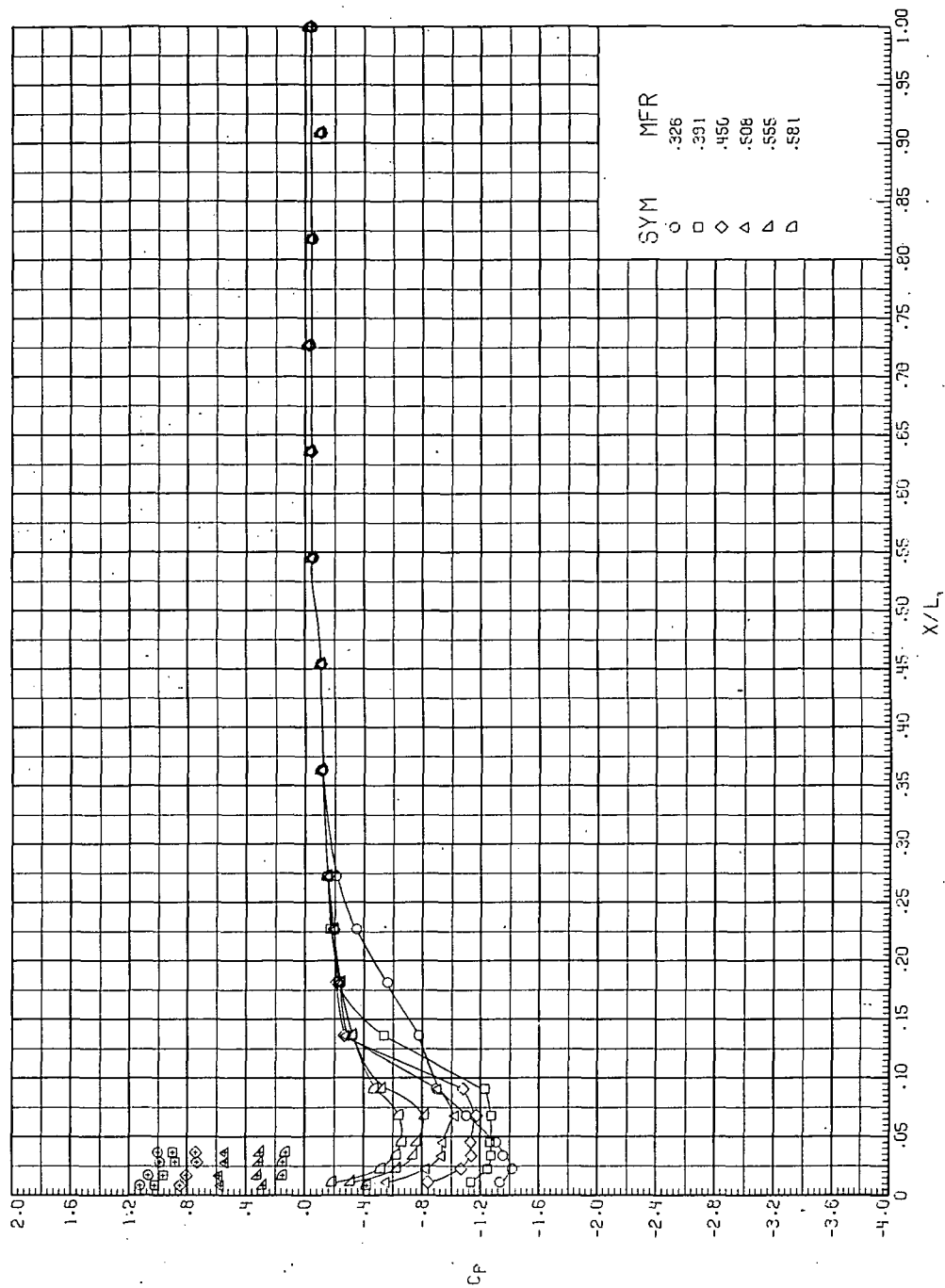
Figure 25.- Continued.

Cp



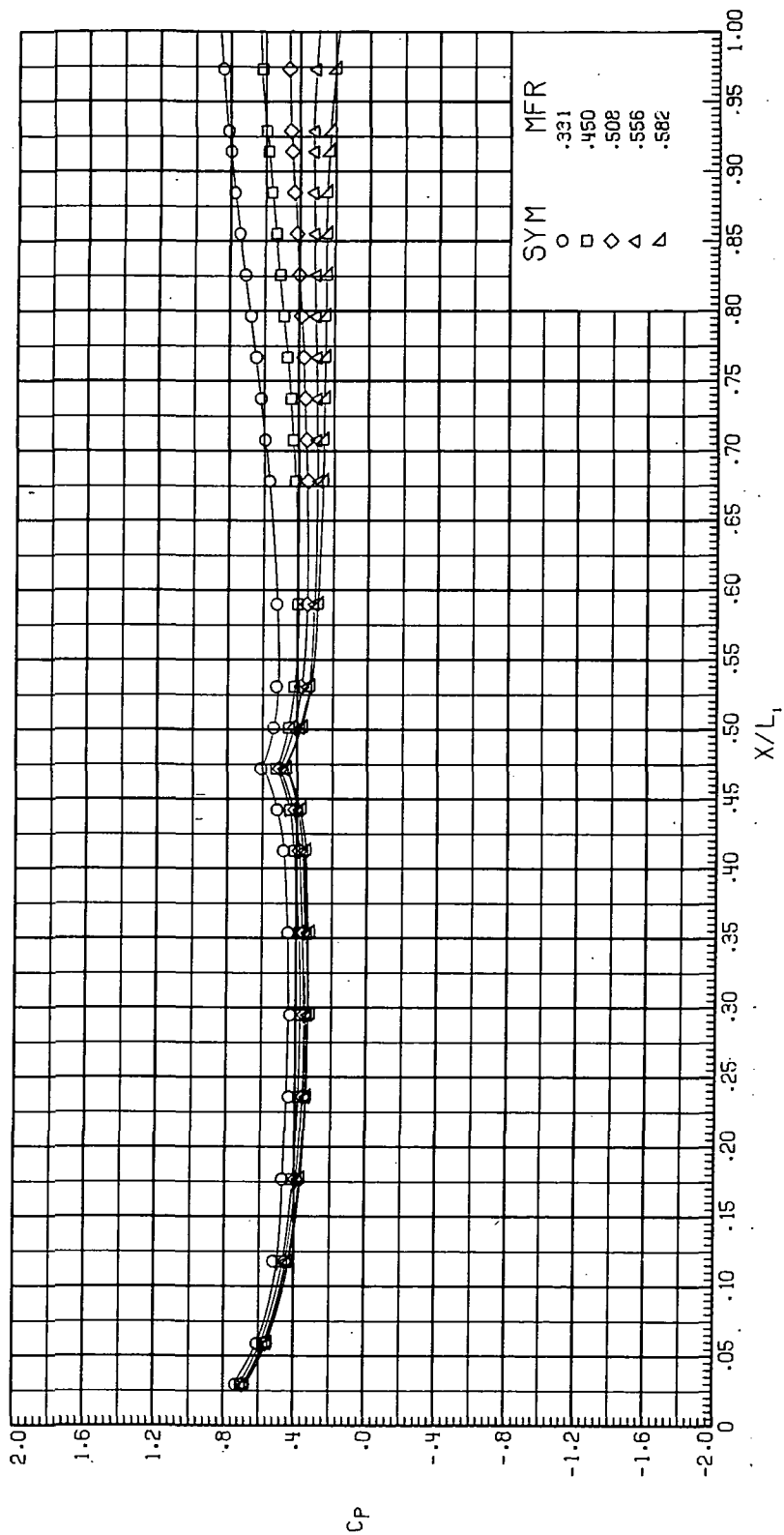
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



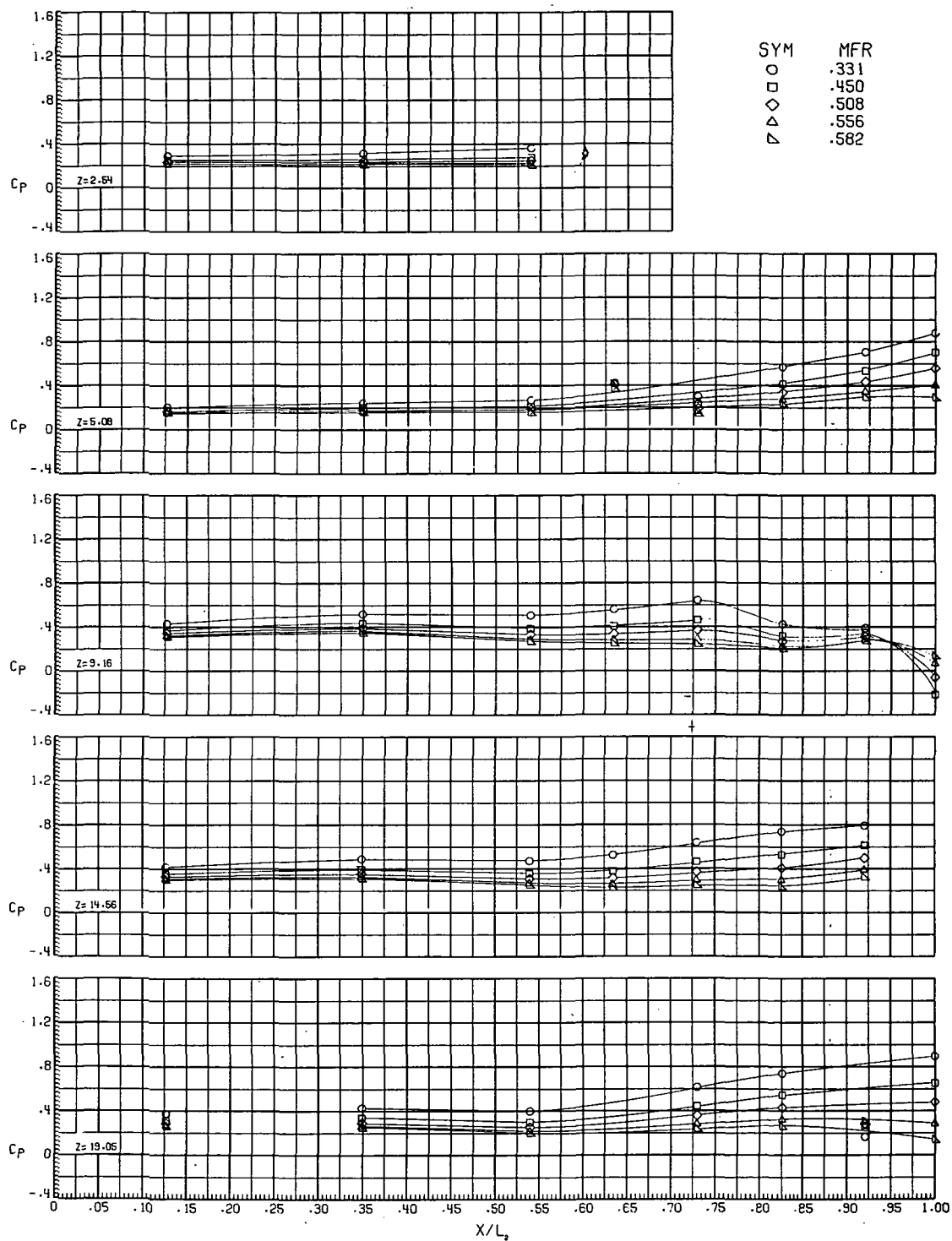
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



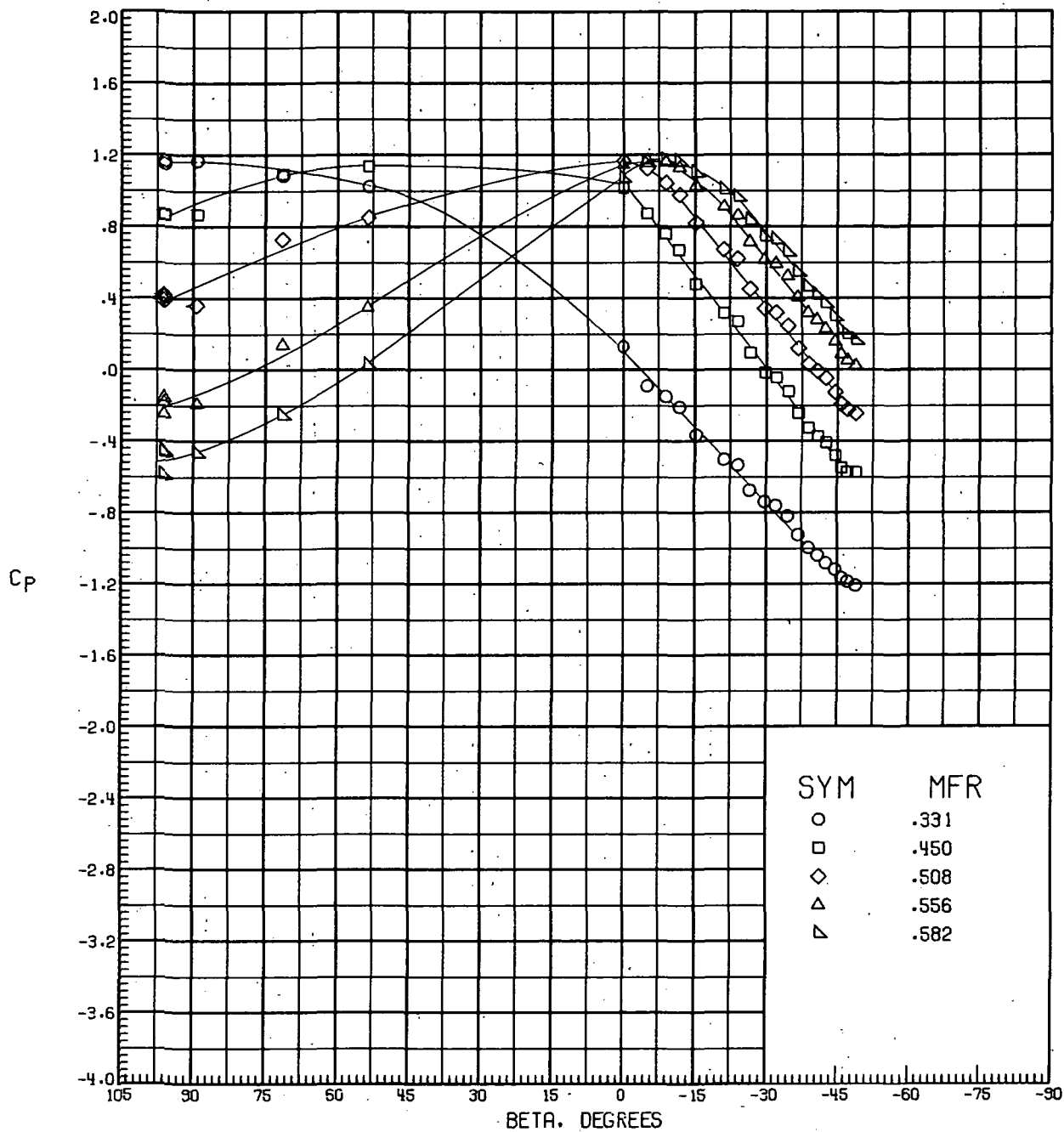
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 25.- Continued.



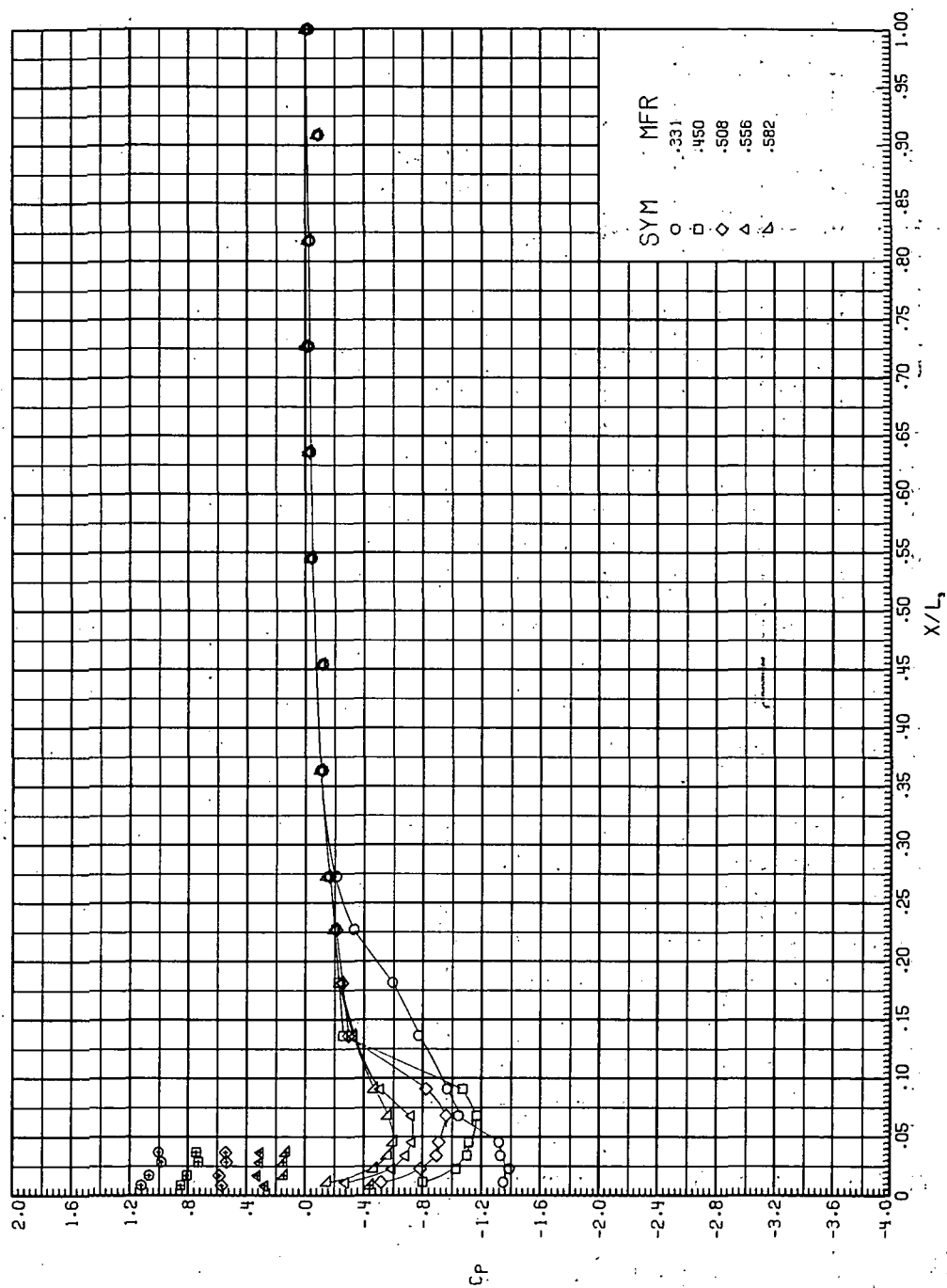
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



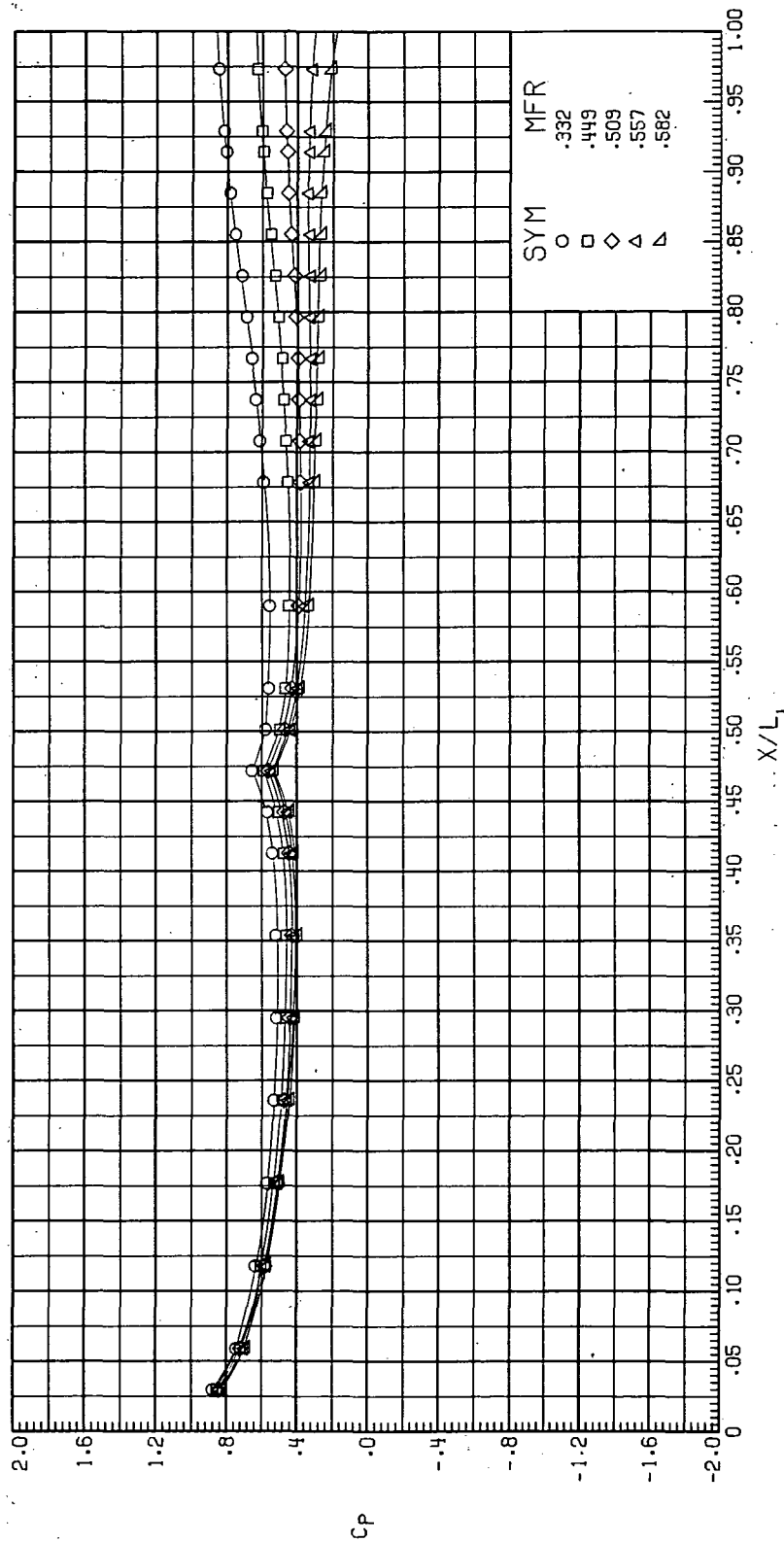
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



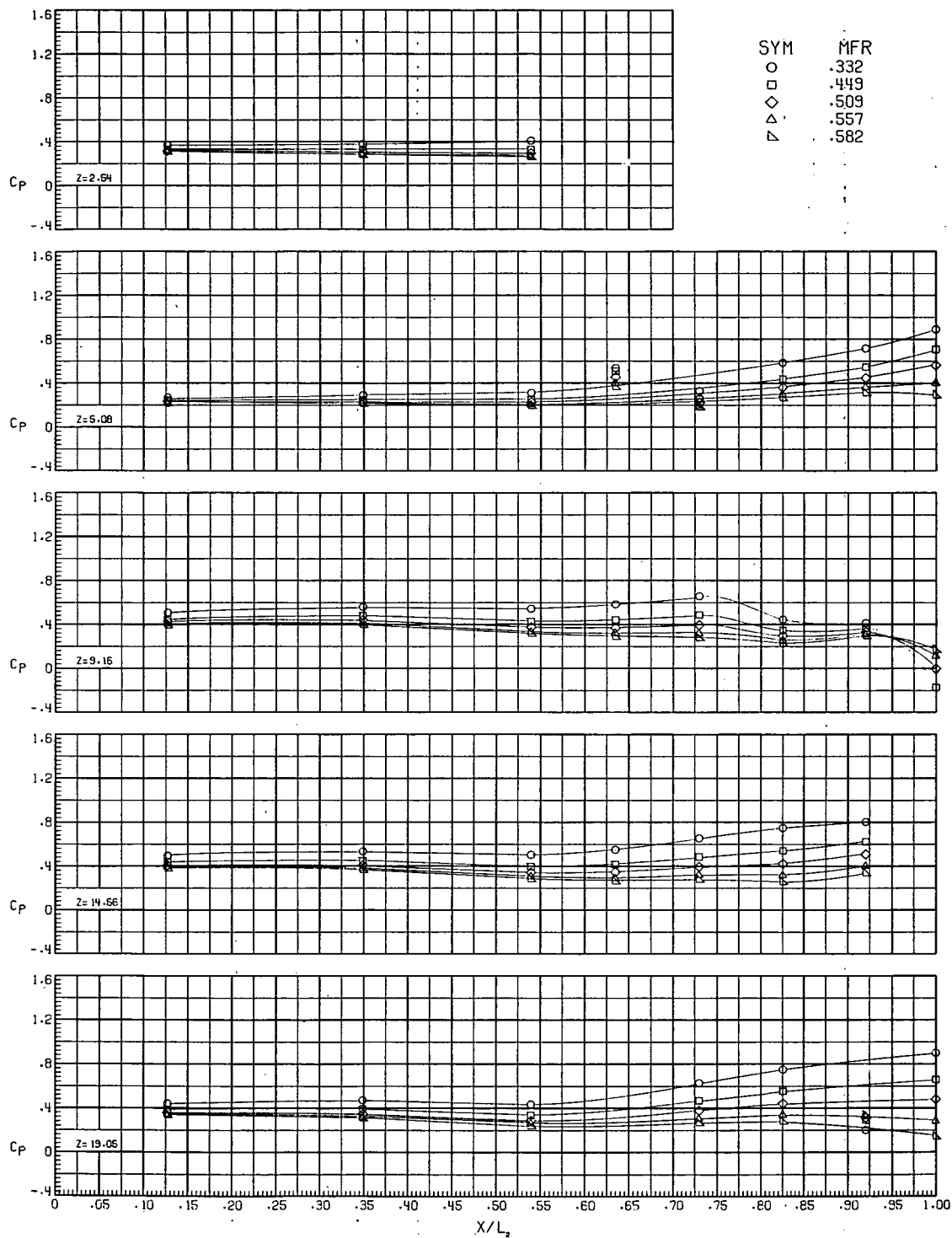
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Continued.



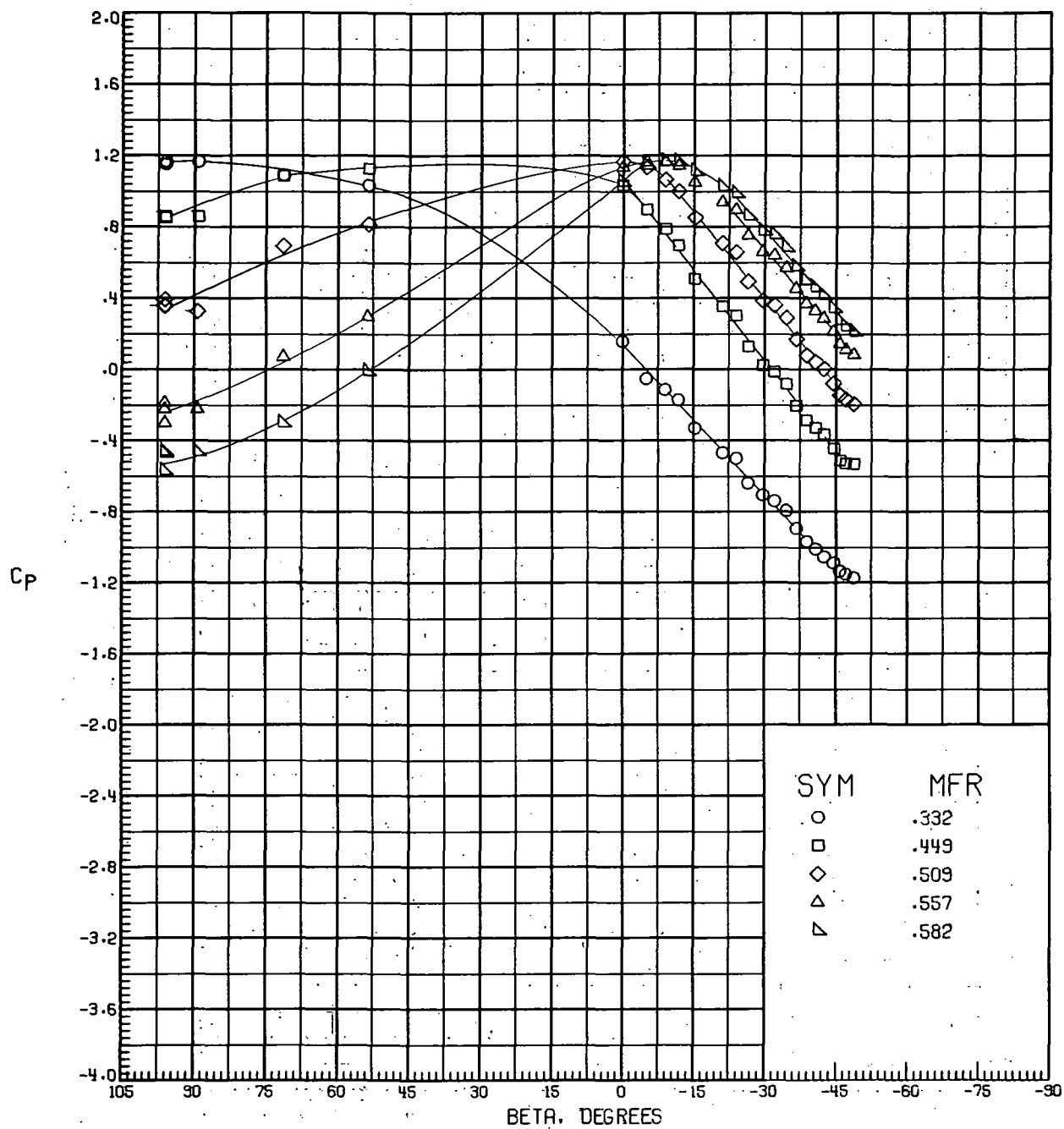
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 25.- Continued.



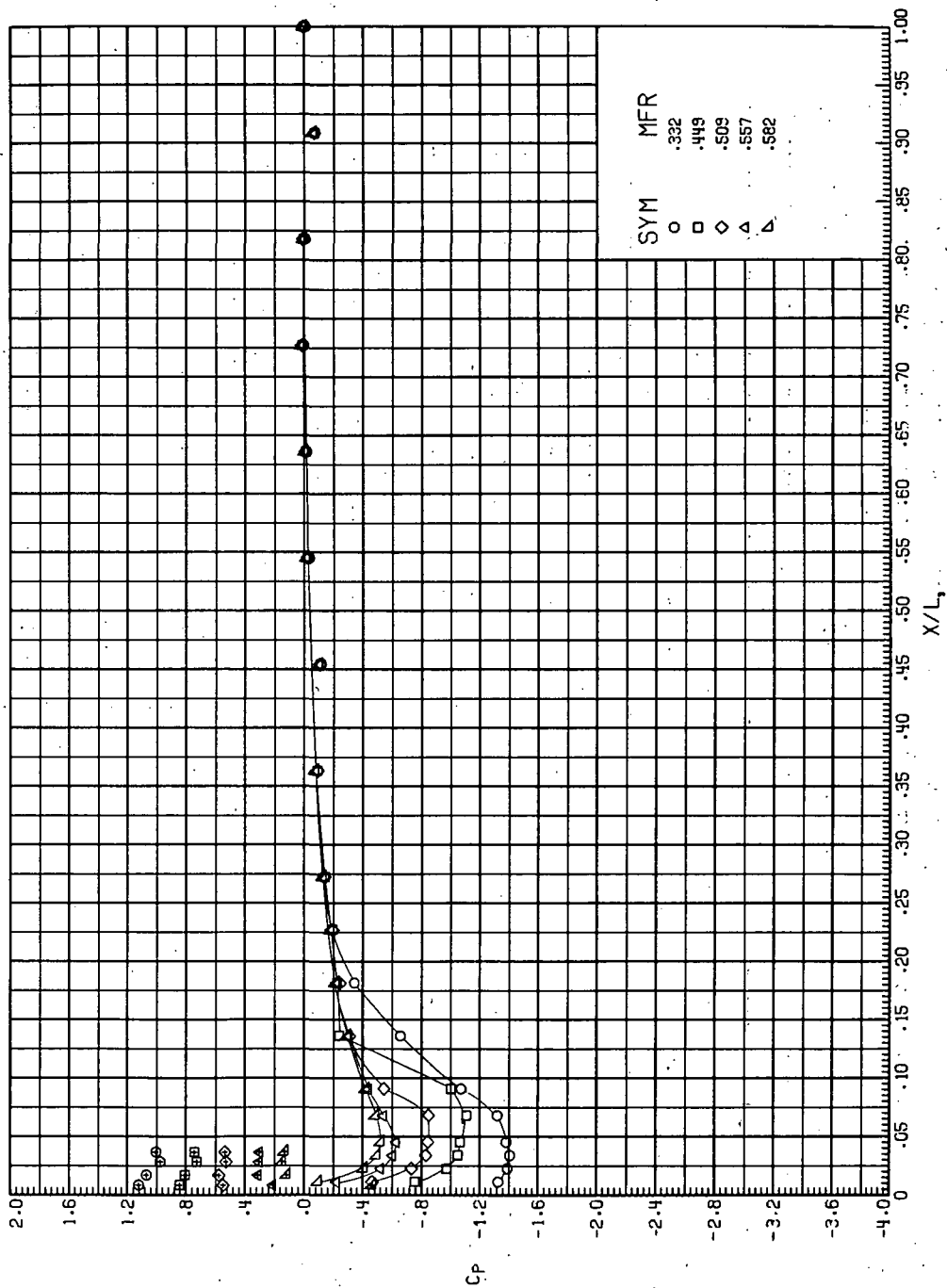
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 25.- Continued.



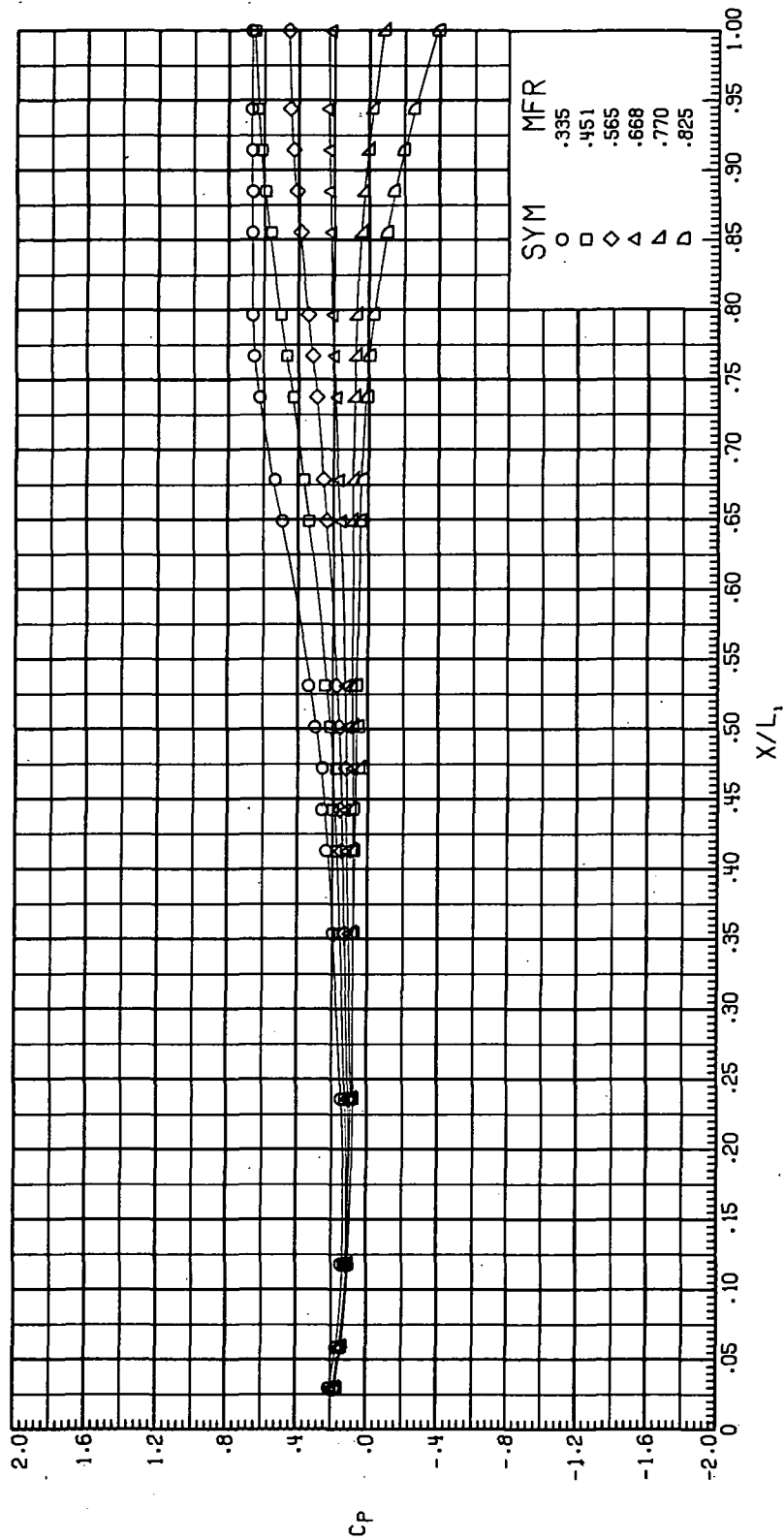
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 25.- Continued.



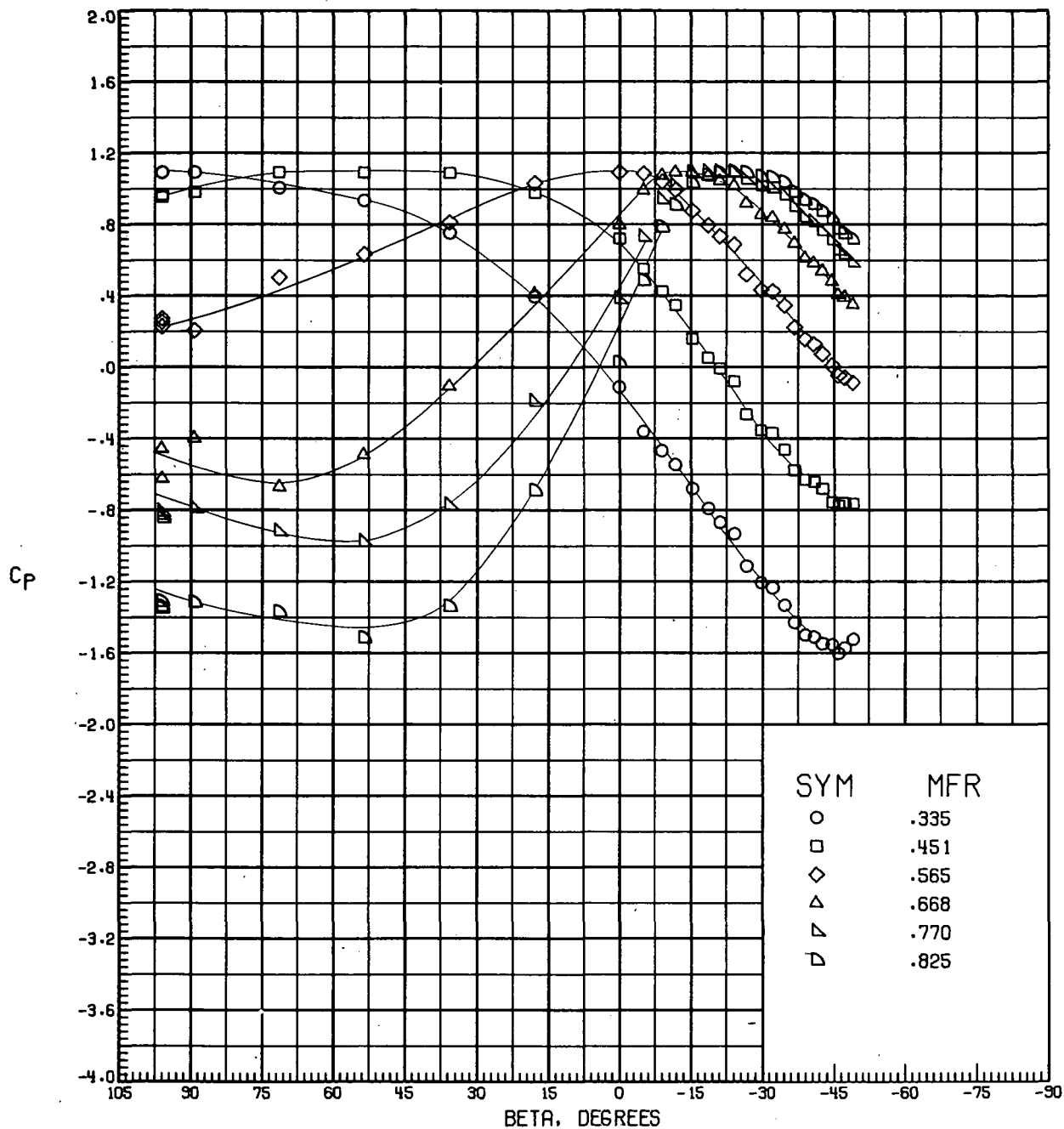
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 25.- Concluded.



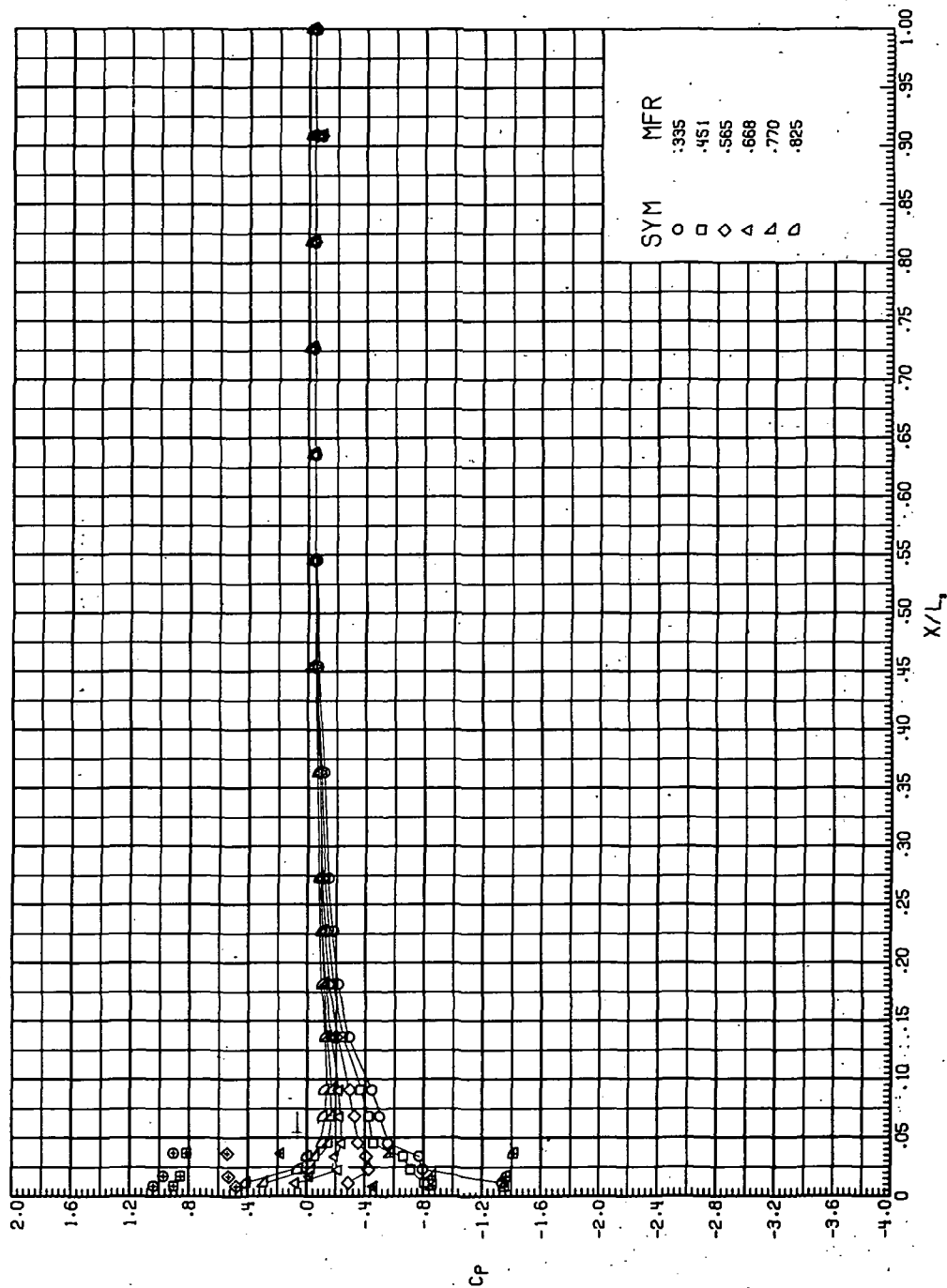
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 26.- Pressure coefficients for cowl 90-1. $\delta_1 = \delta_2 = 5^\circ$; swept sideplate.



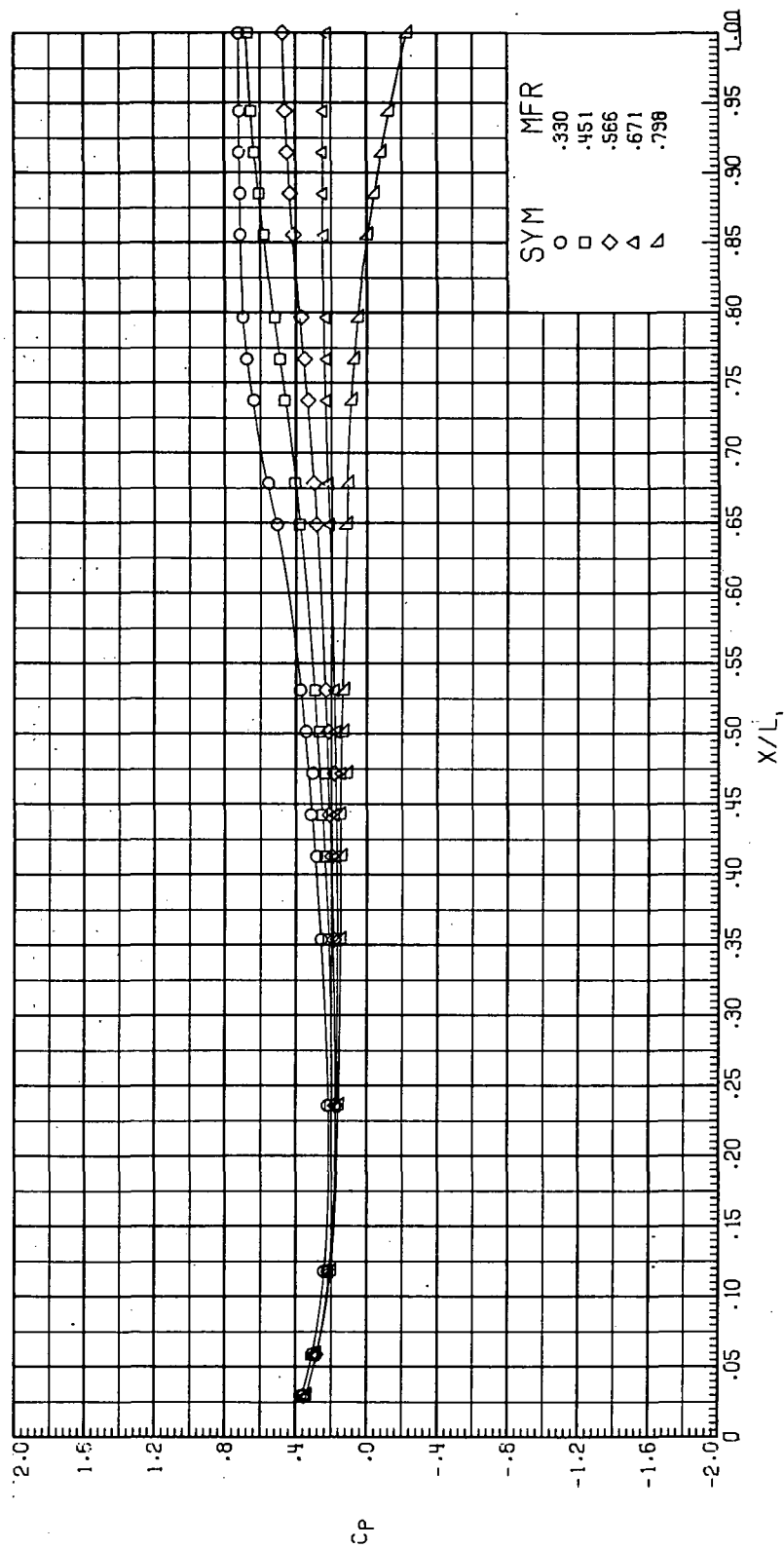
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



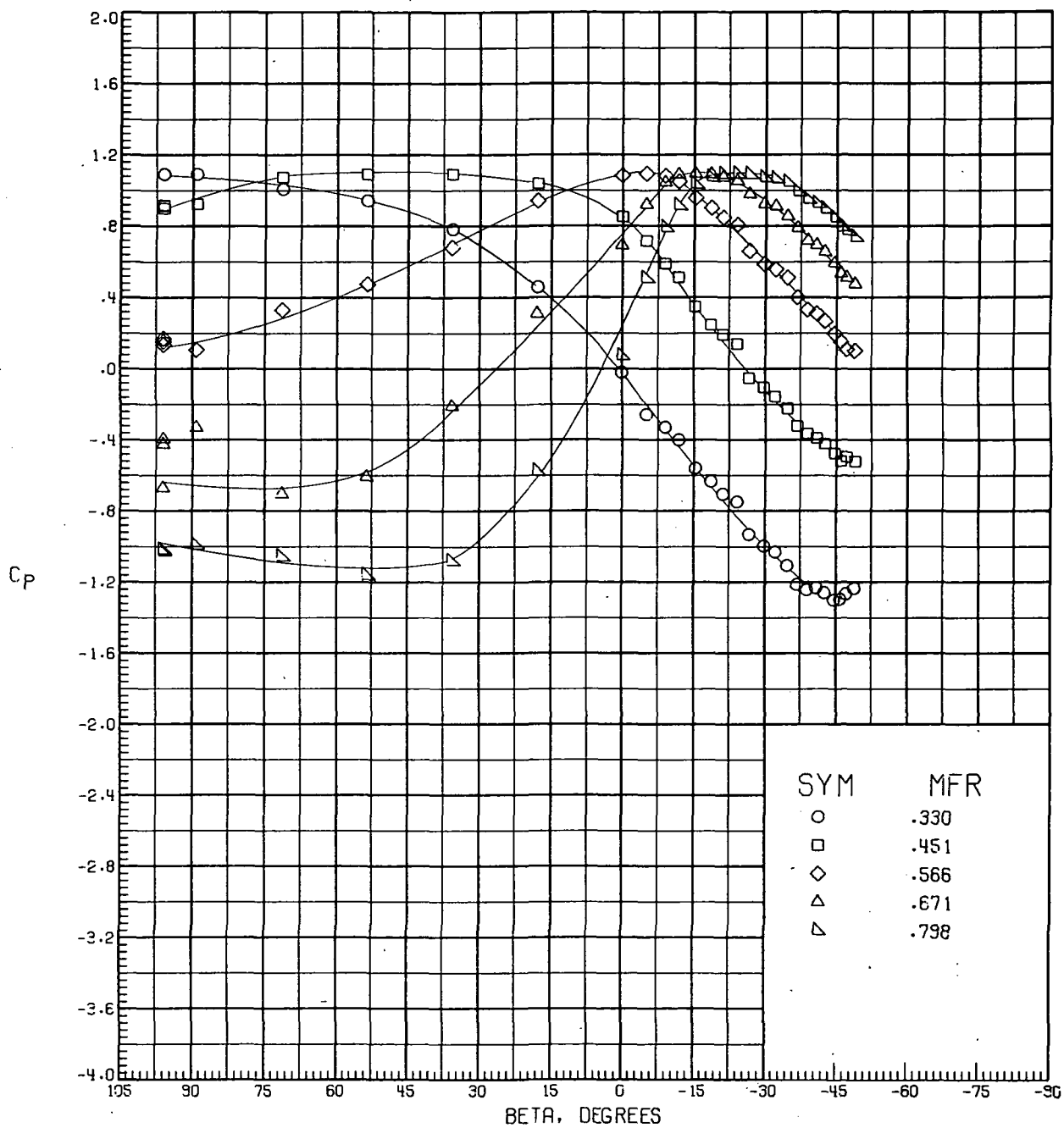
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Continued.



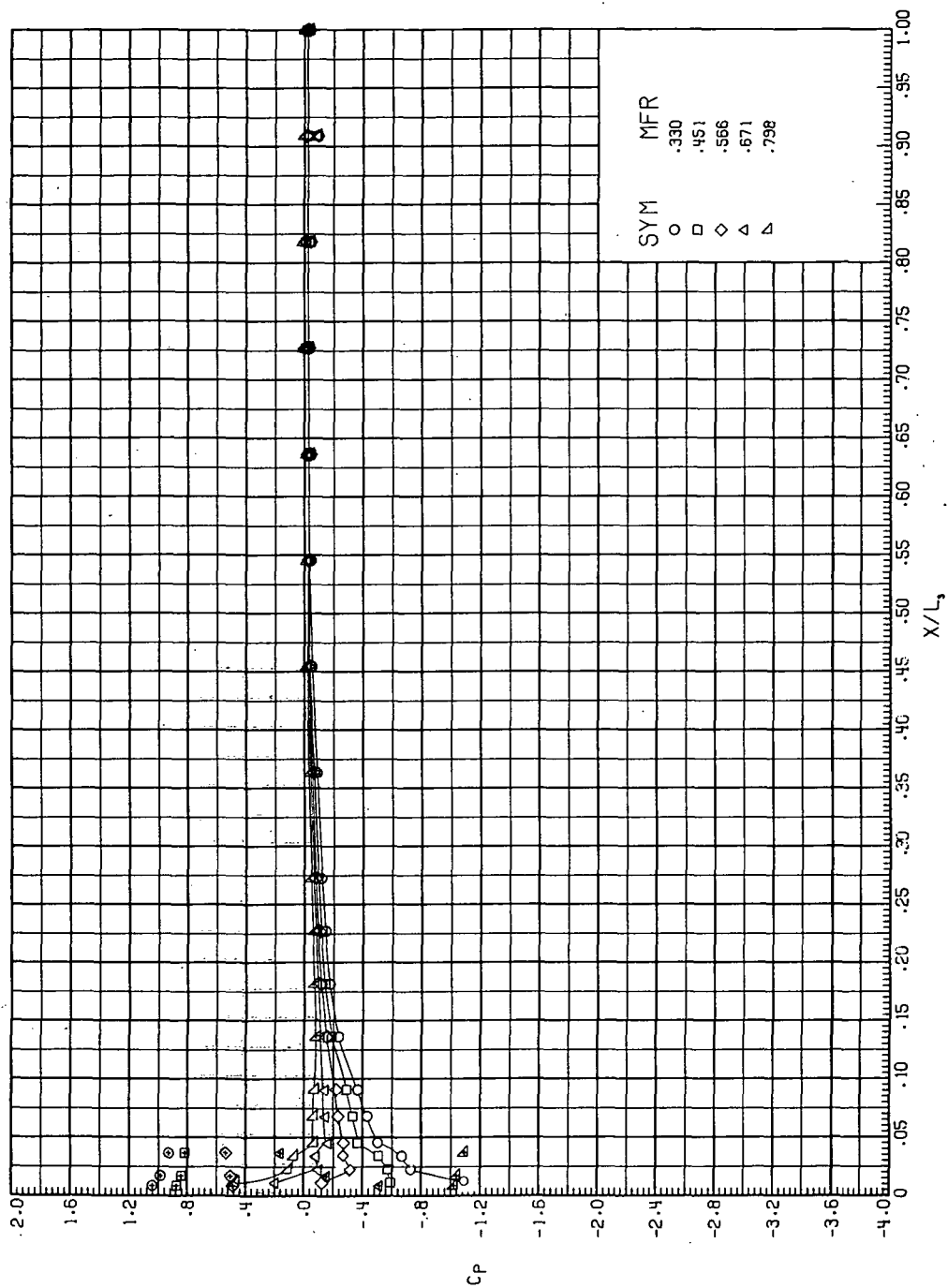
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 26.- Continued.



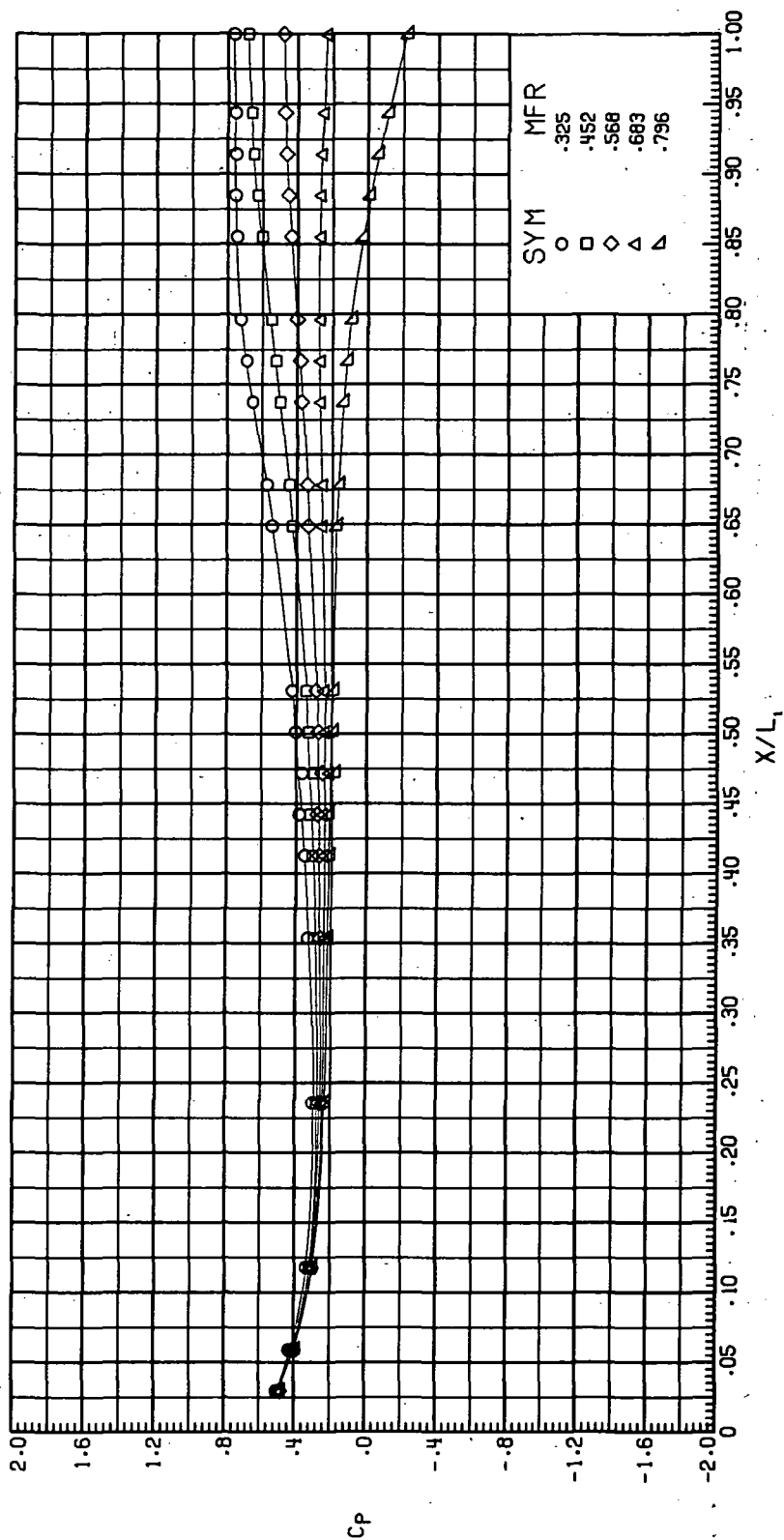
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



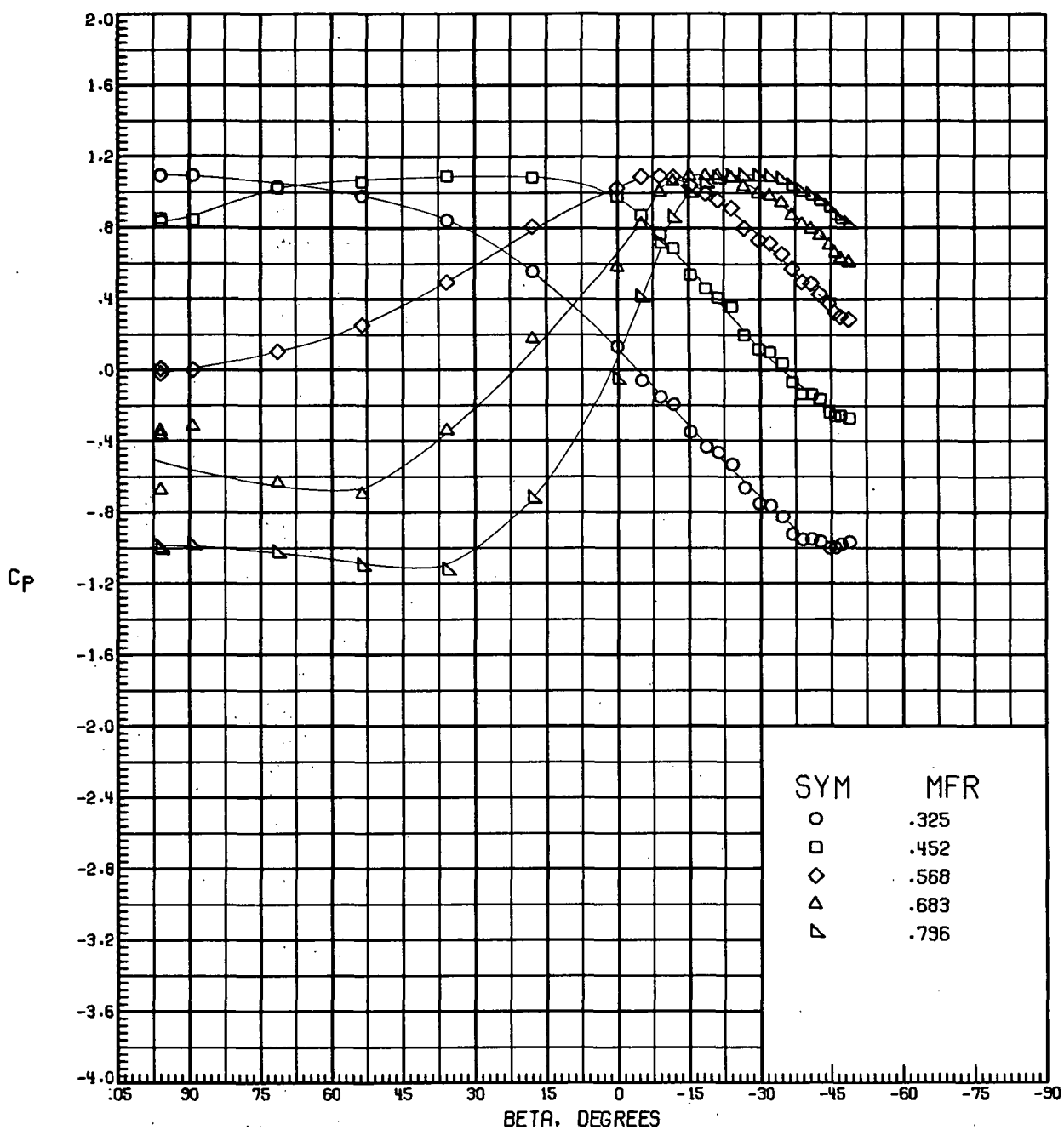
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Continued.



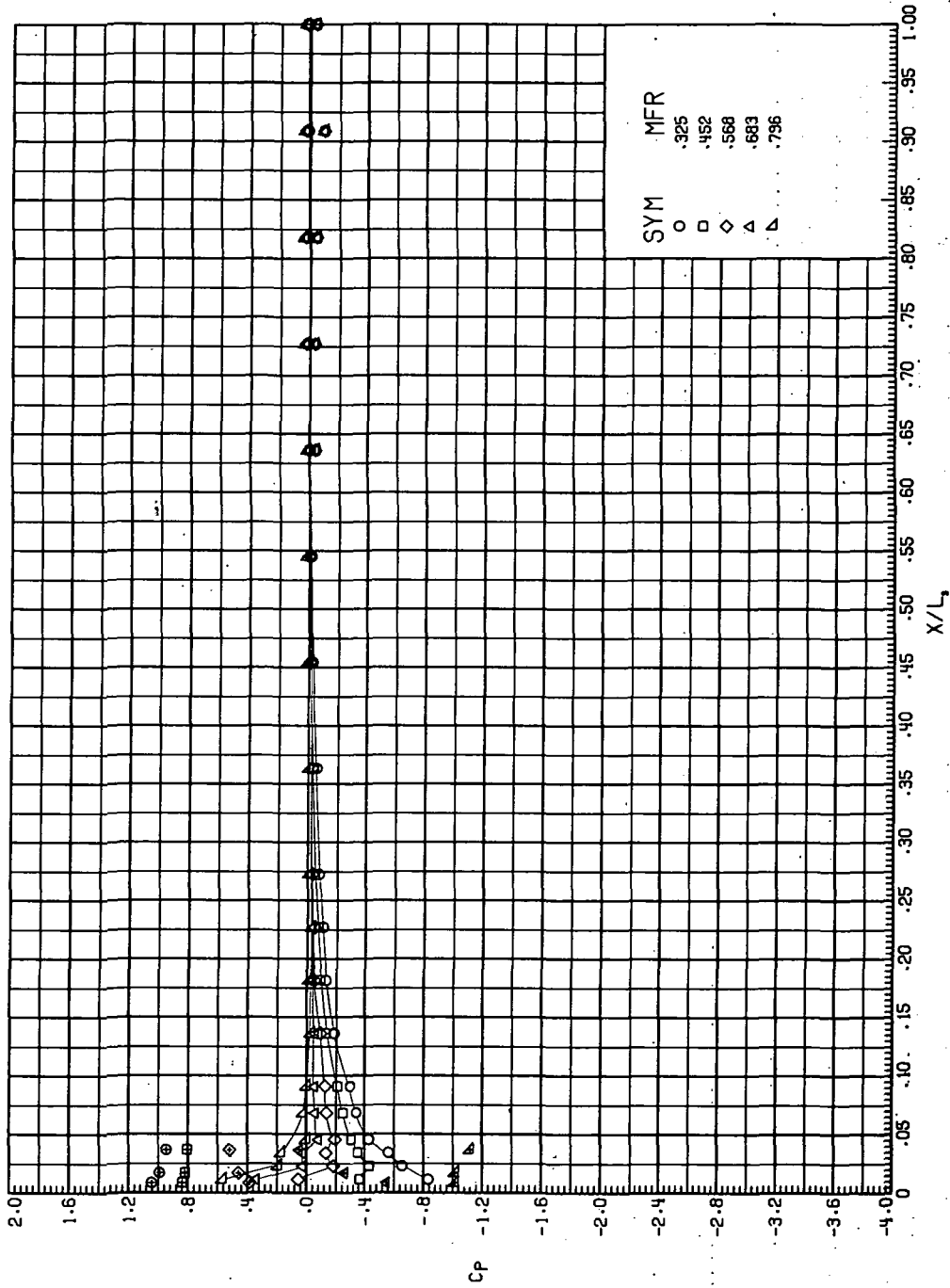
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 26.- Continued.



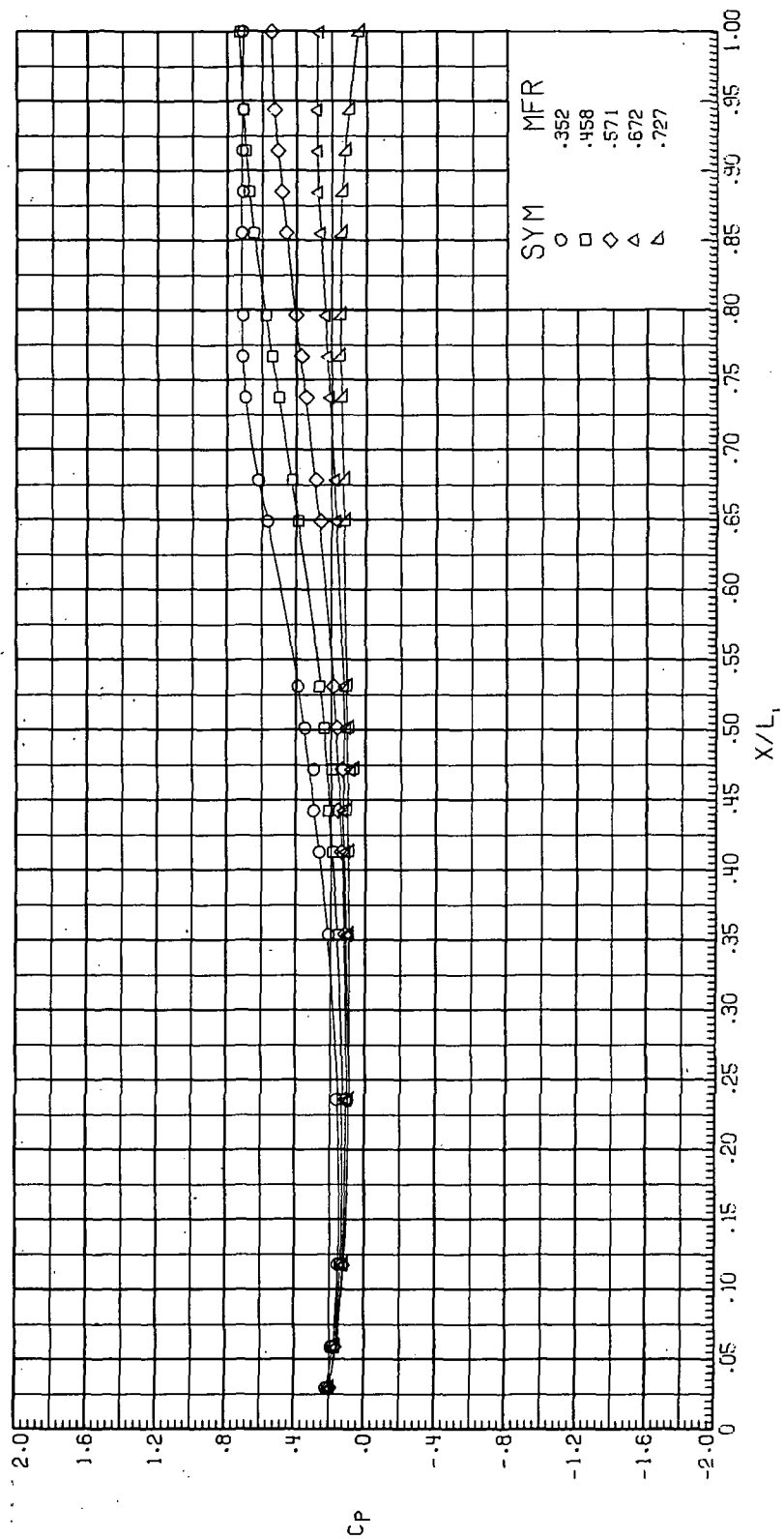
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



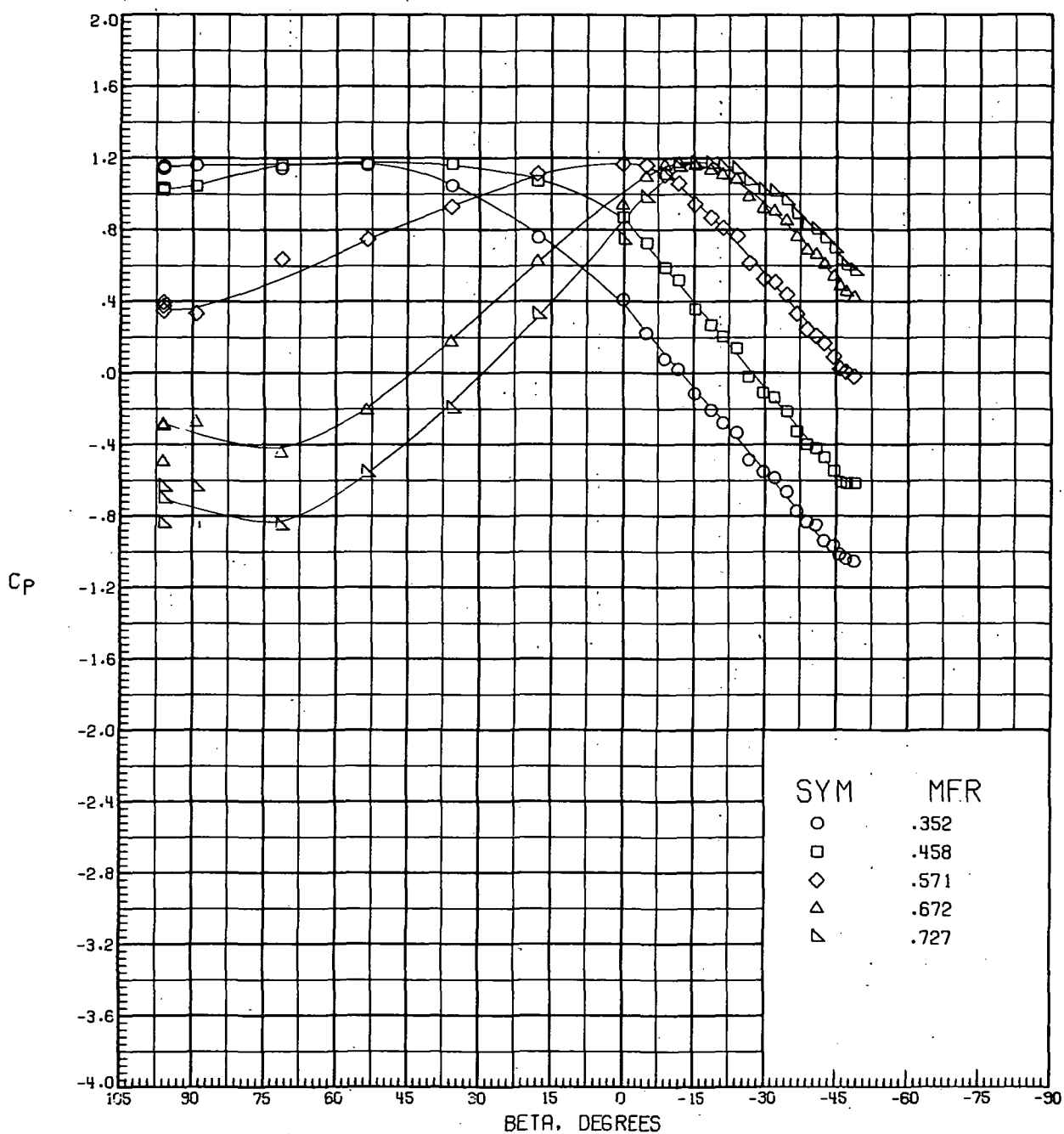
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Continued.



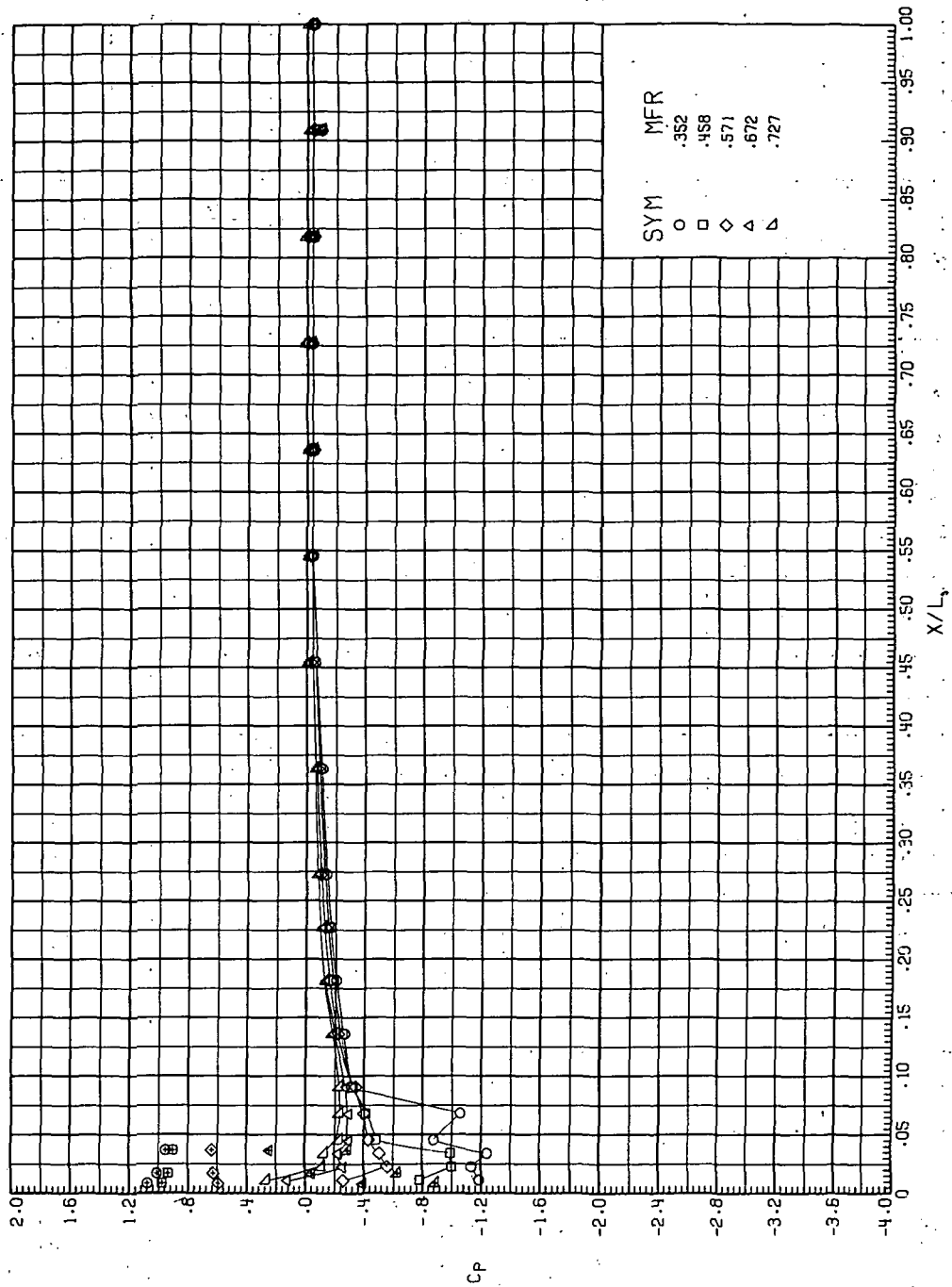
(d) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 26.- Continued.



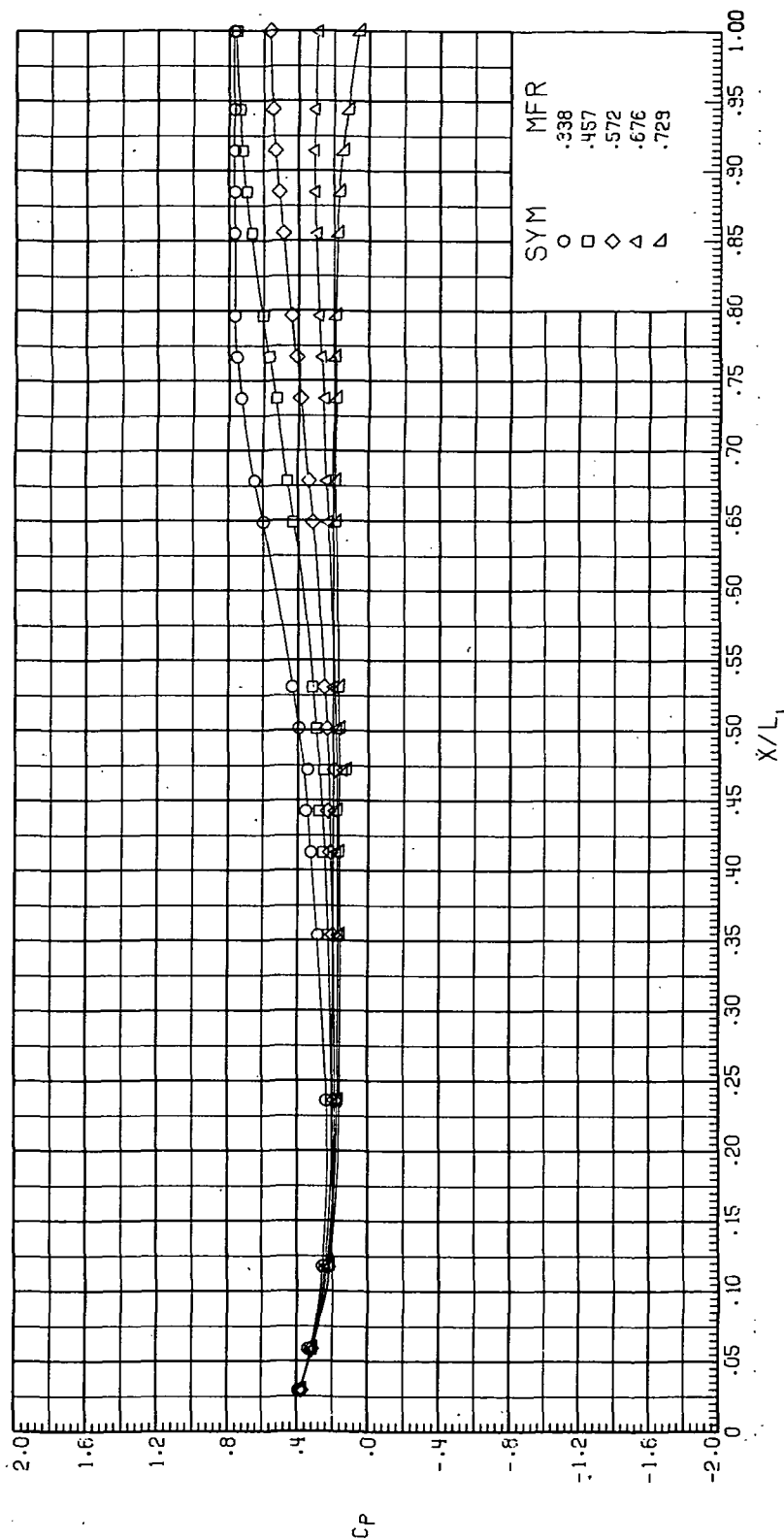
(d) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



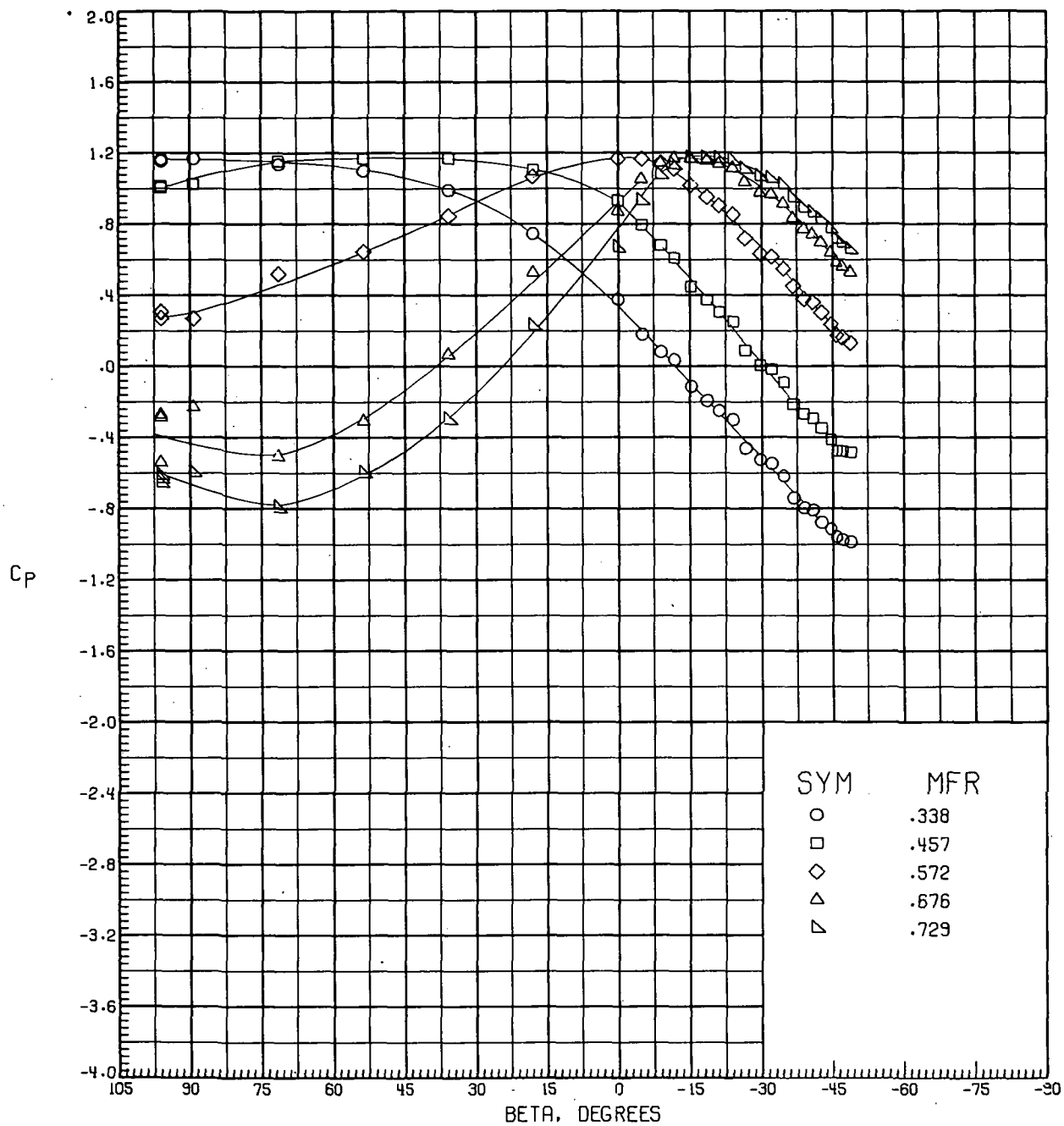
(d) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Continued.



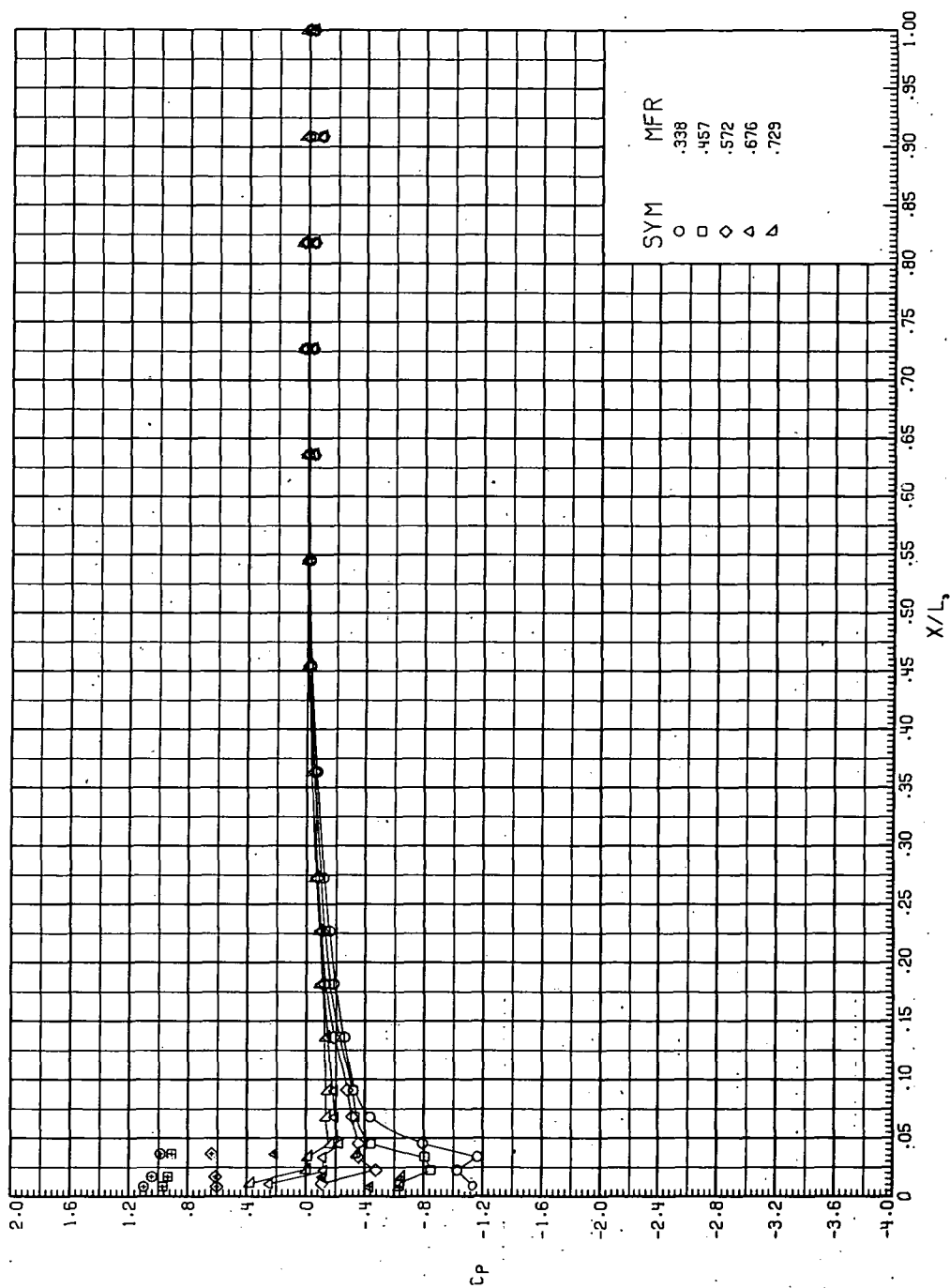
(e) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 26.- Continued.



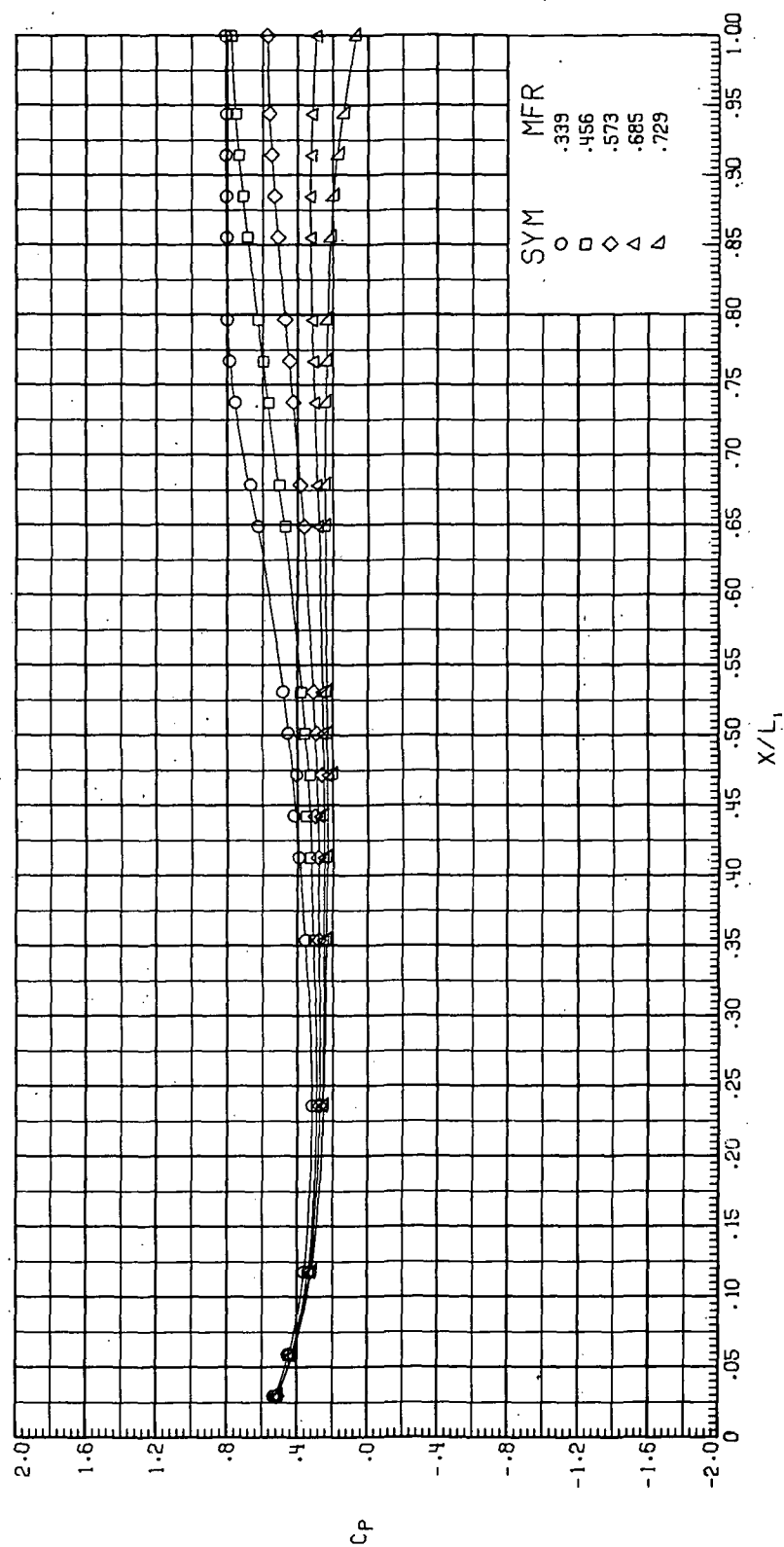
(e) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



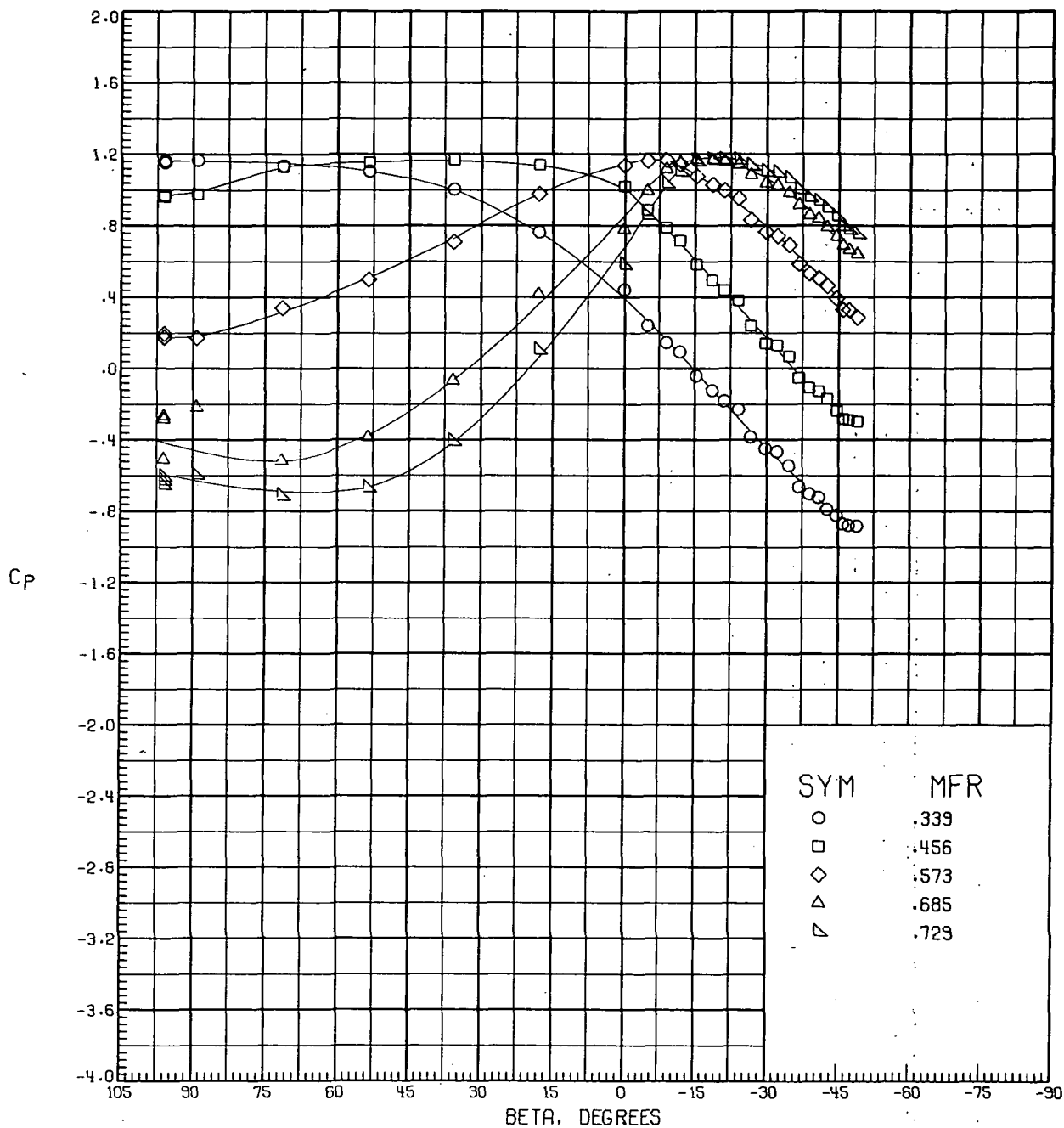
(e) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Continued.



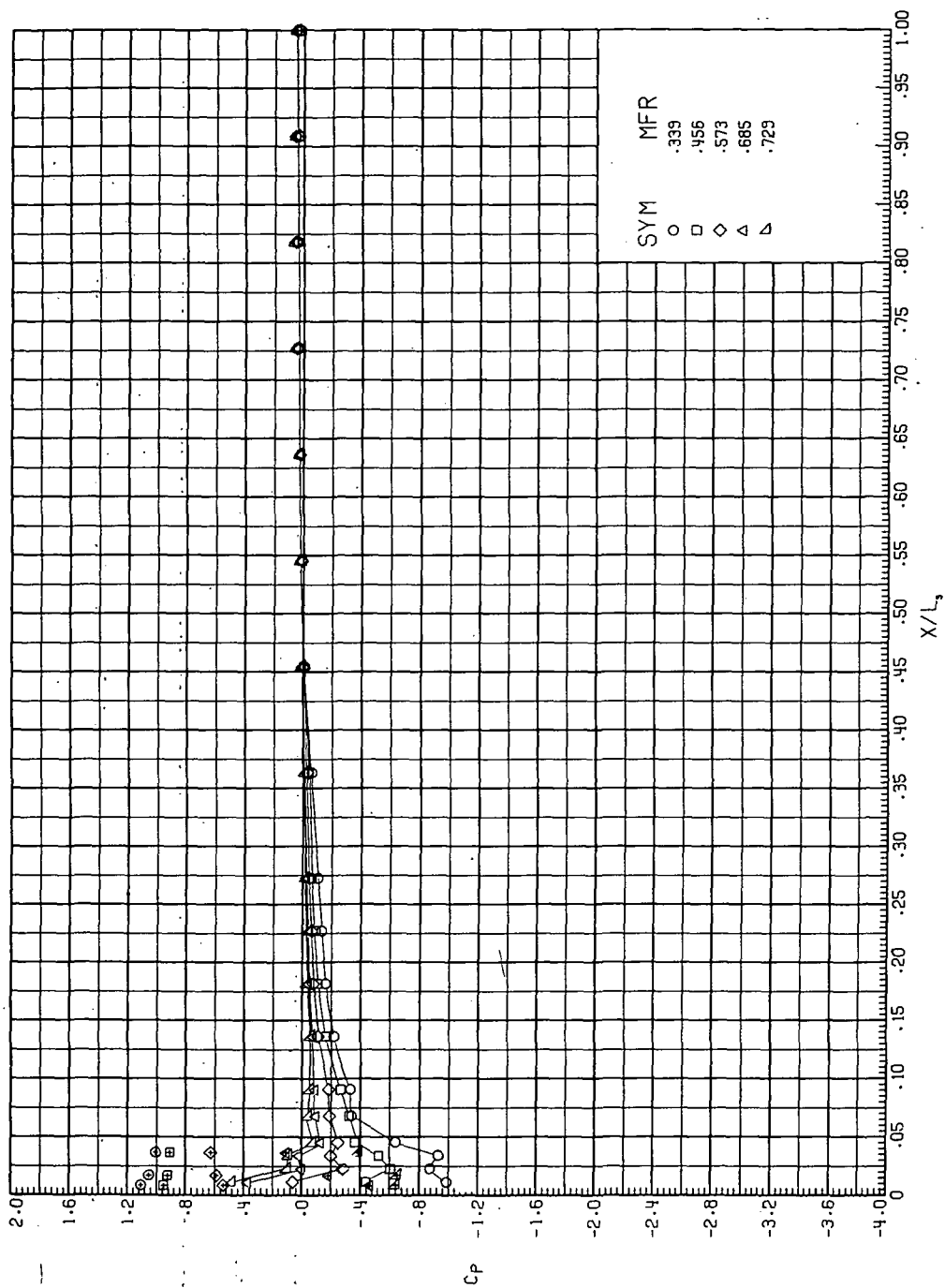
(f) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 26.- Continued.



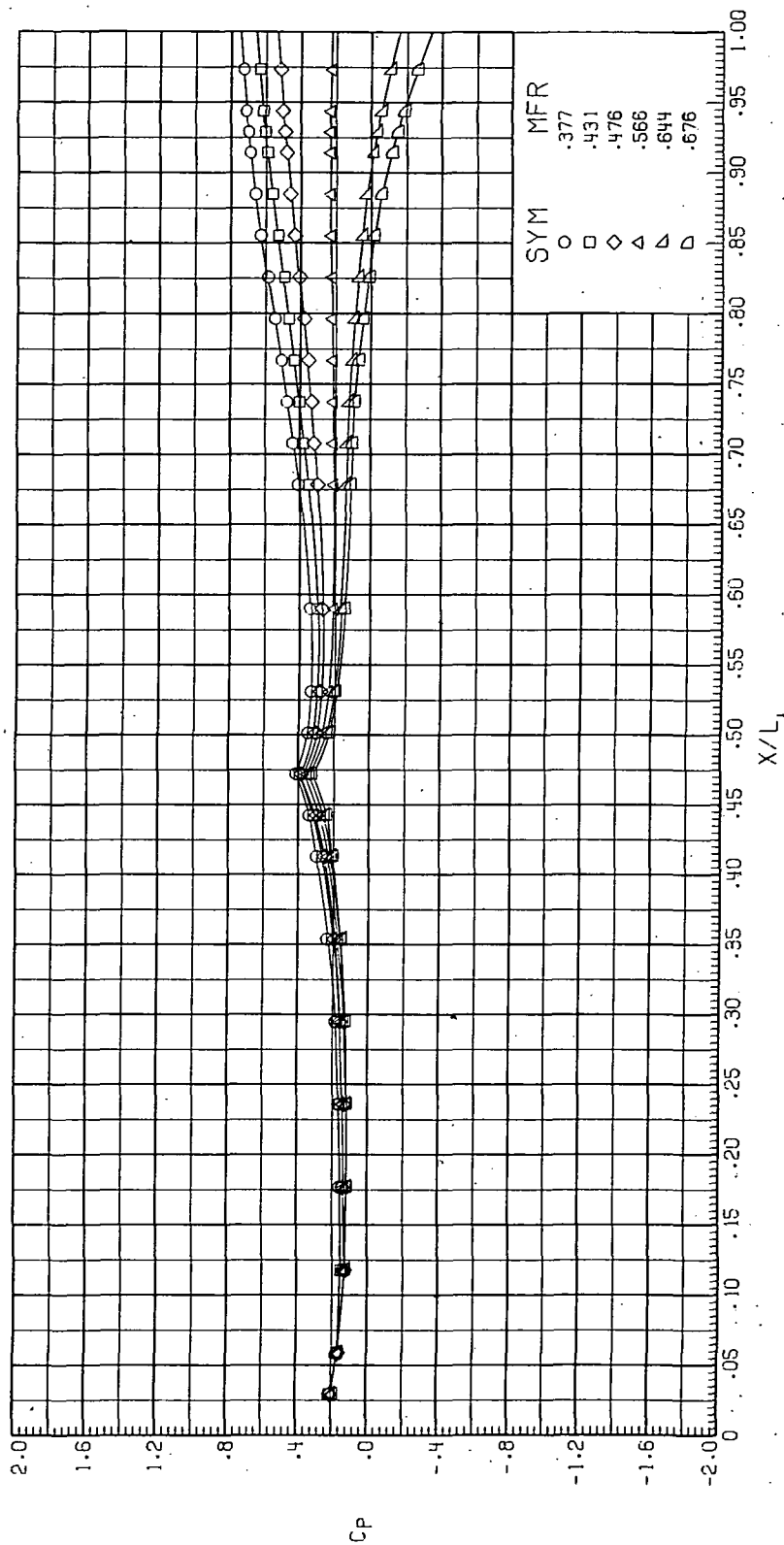
(f) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 26.- Continued.



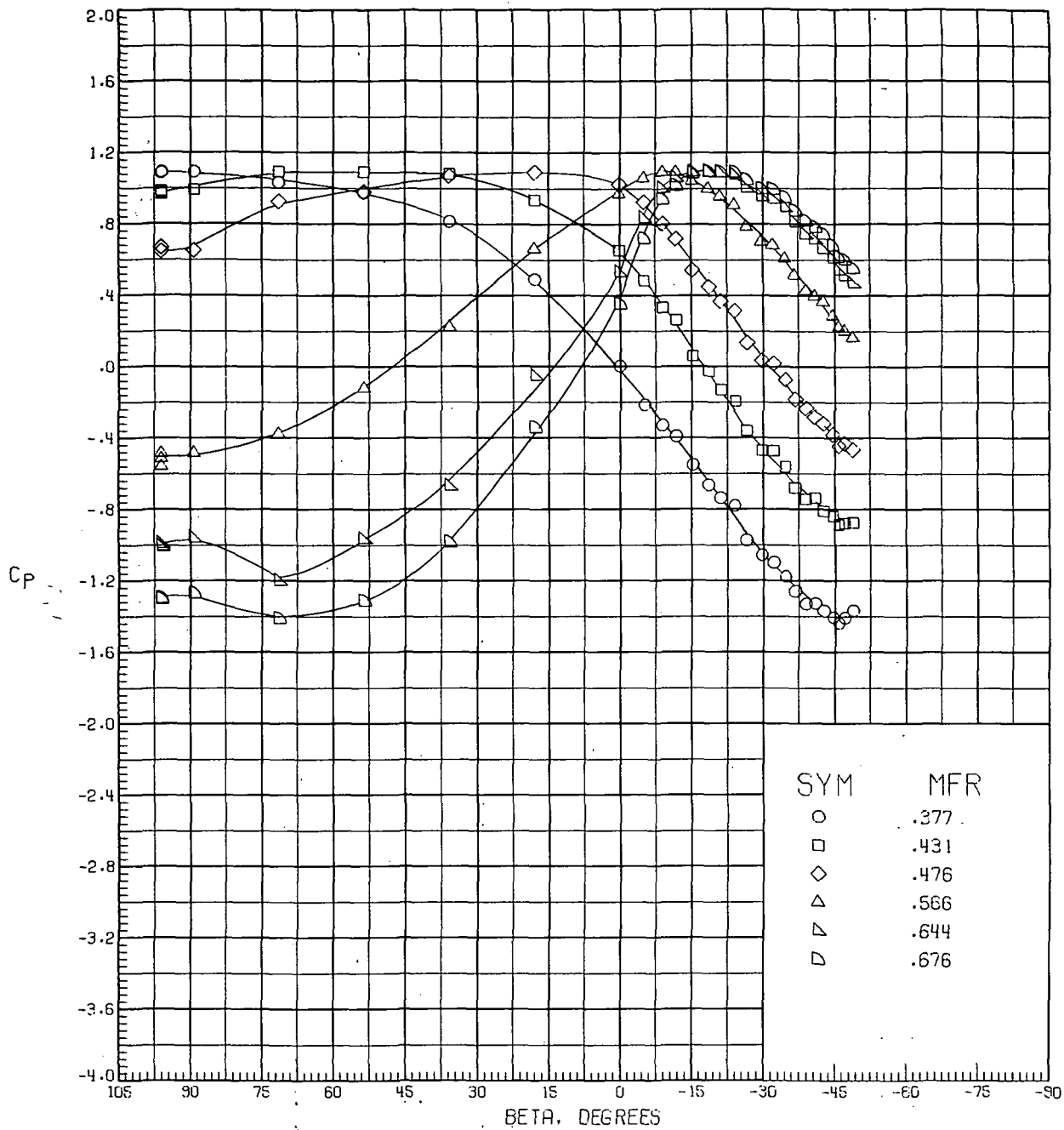
(f) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 26.- Concluded.



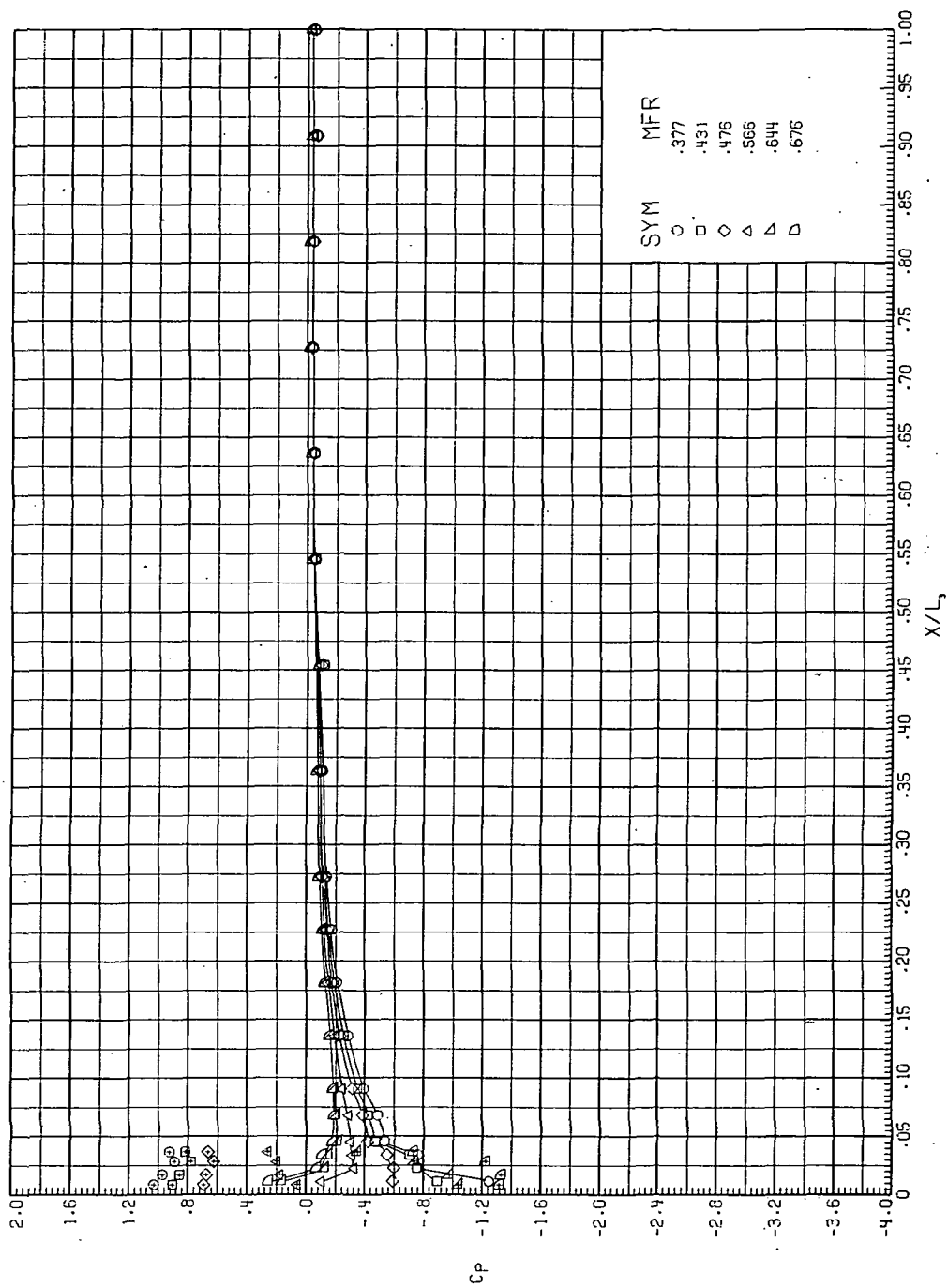
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 27.- Pressure coefficients for cowl 90-1. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$; swept sideplate.



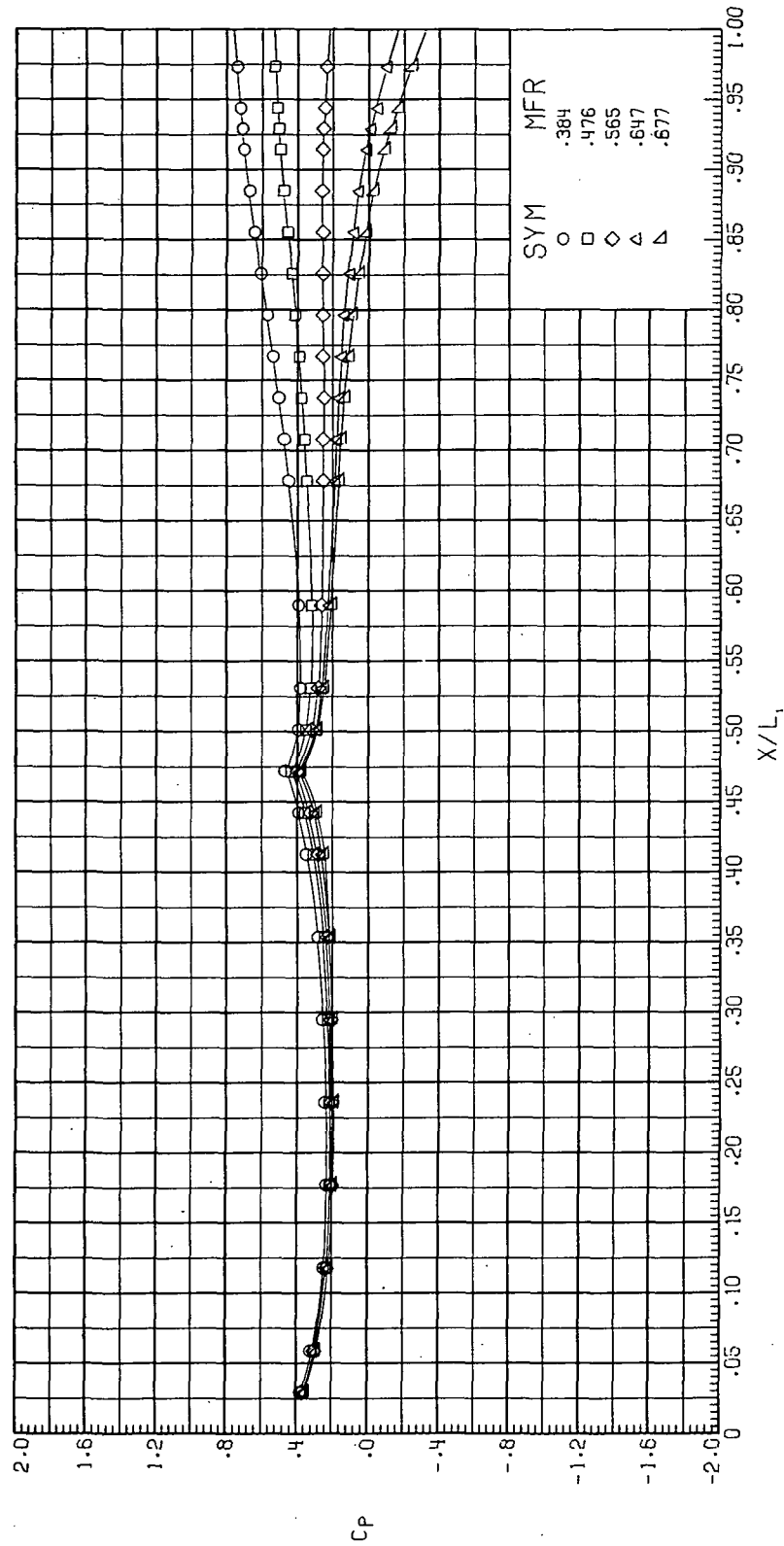
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



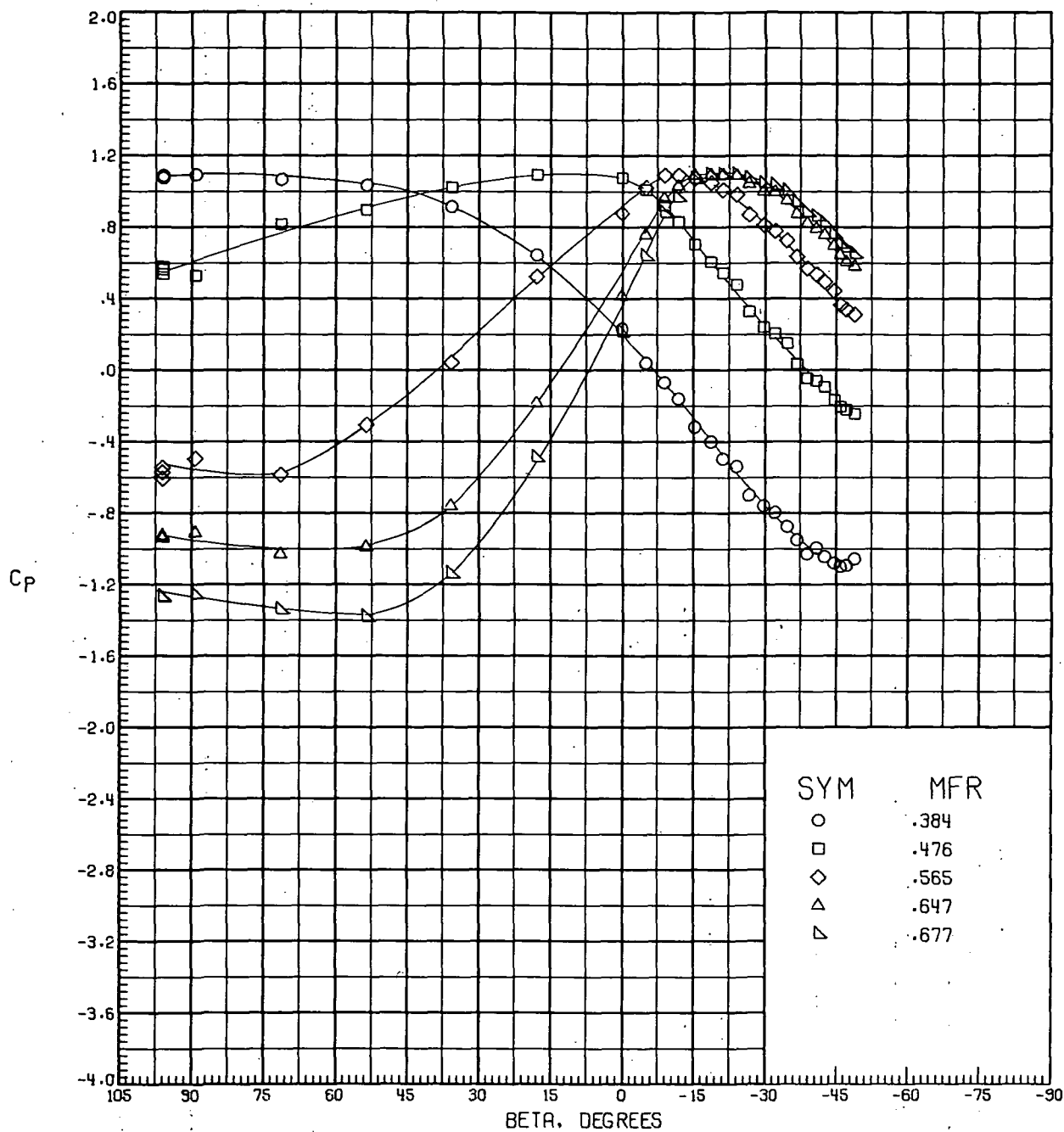
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27. - Continued.



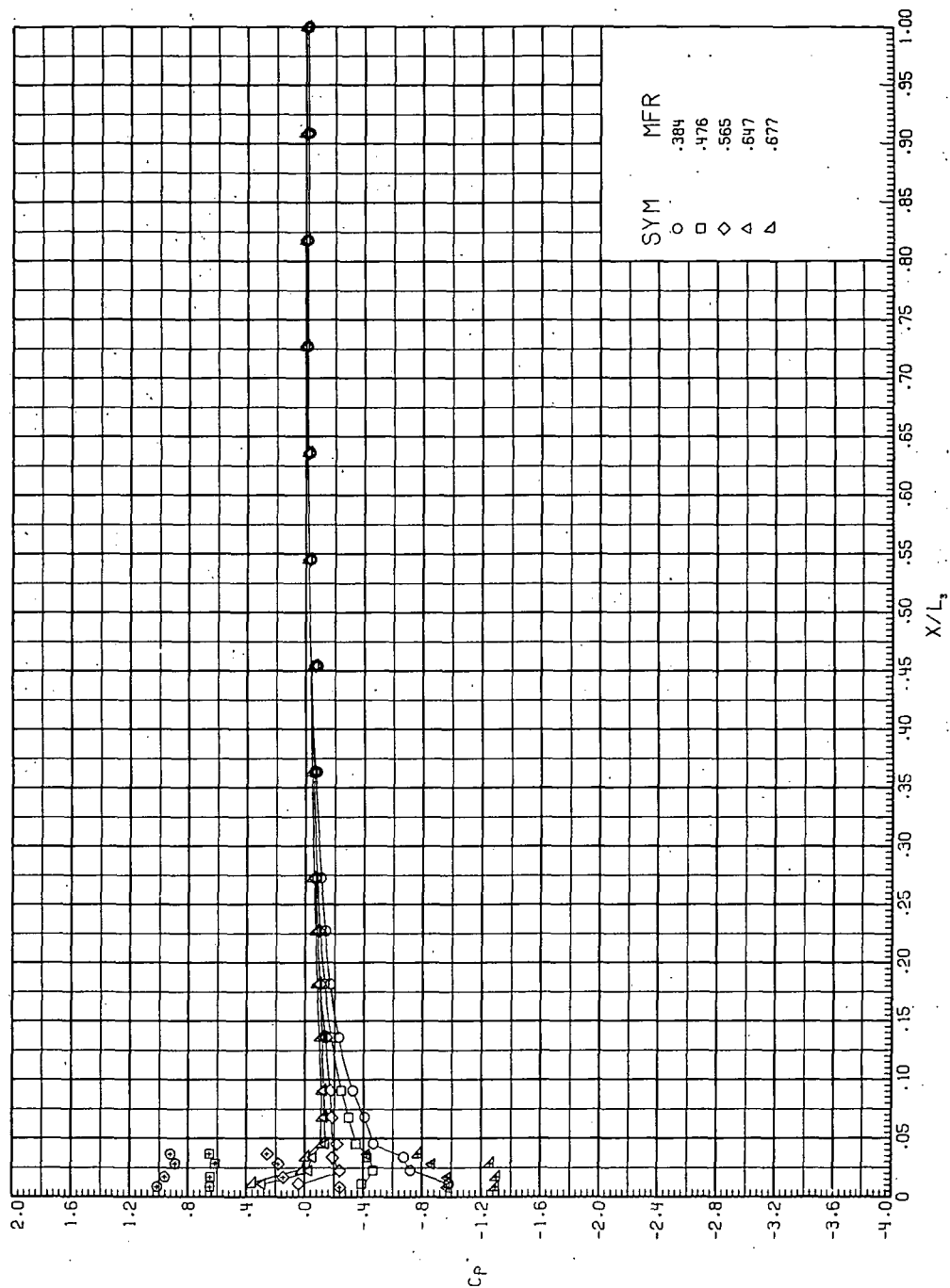
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 27.- Continued.



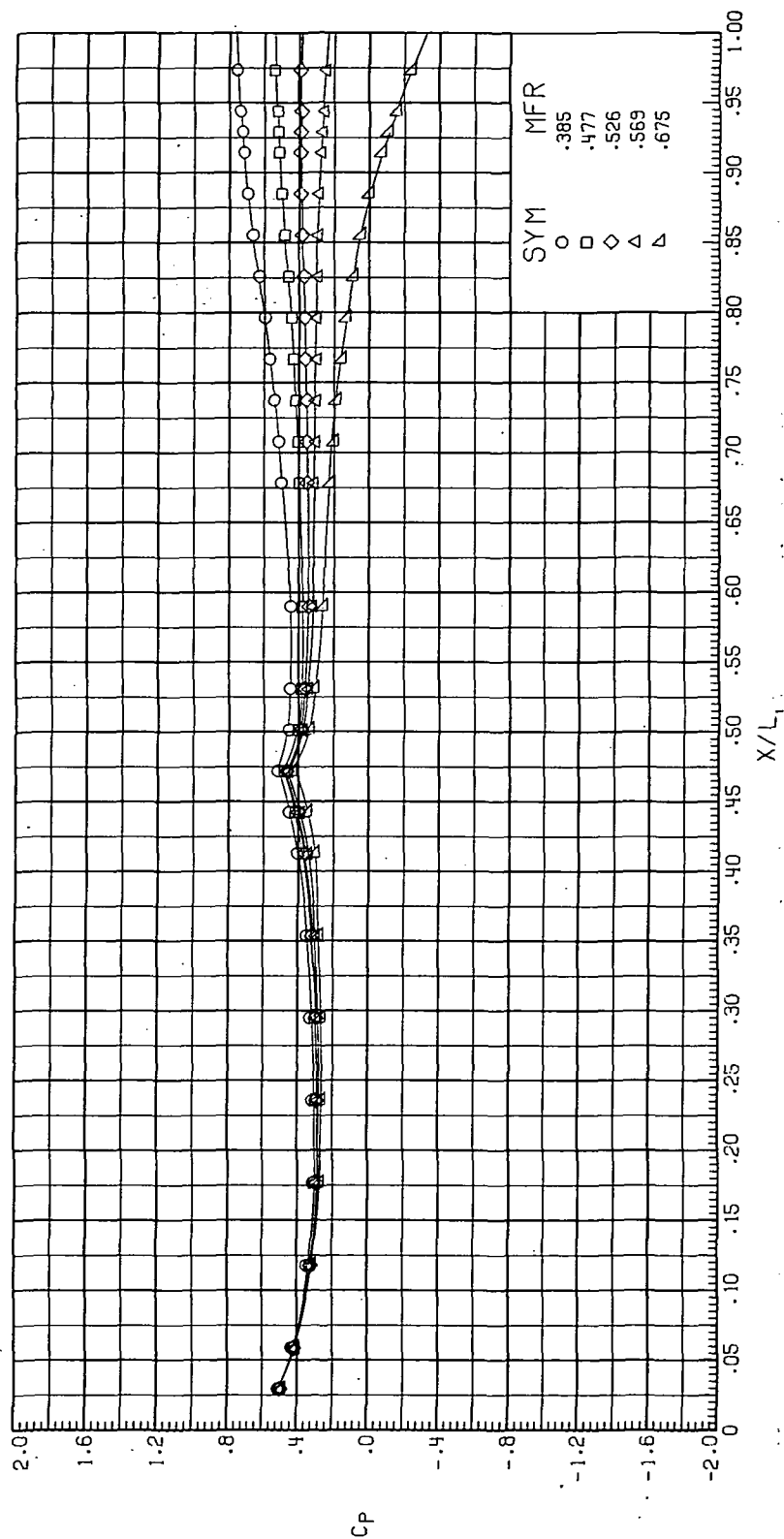
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



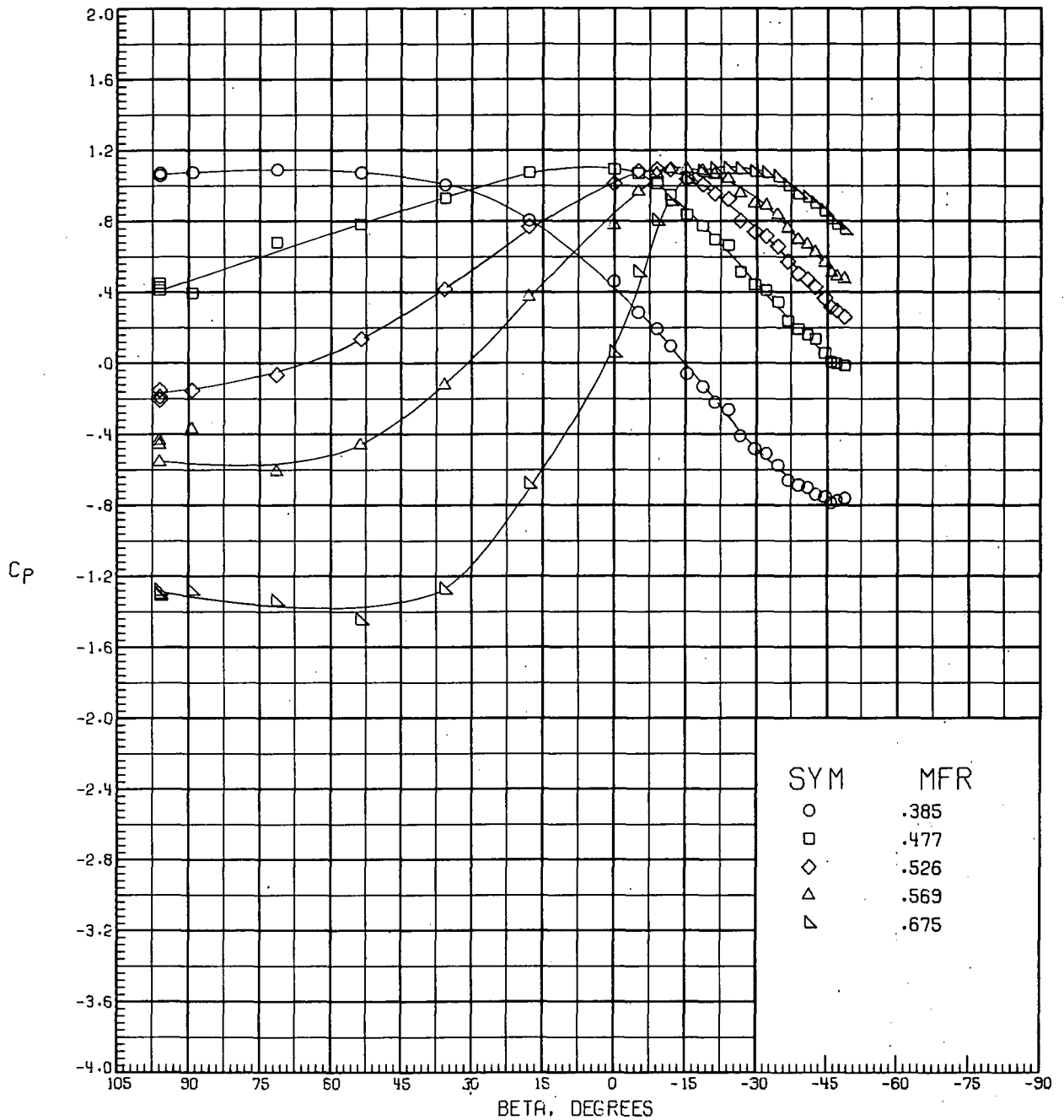
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27. - Continued.



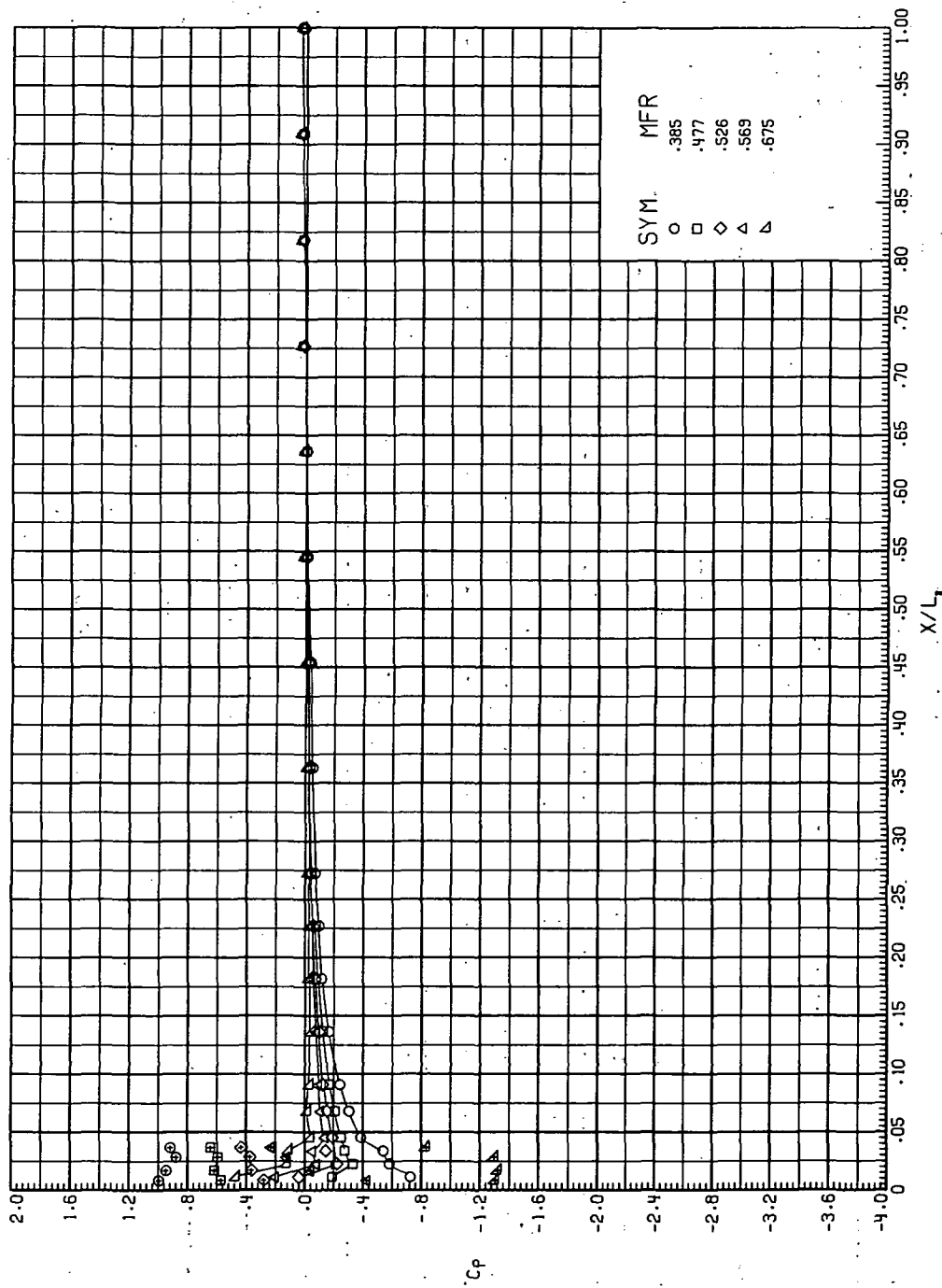
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 27. - Continued.



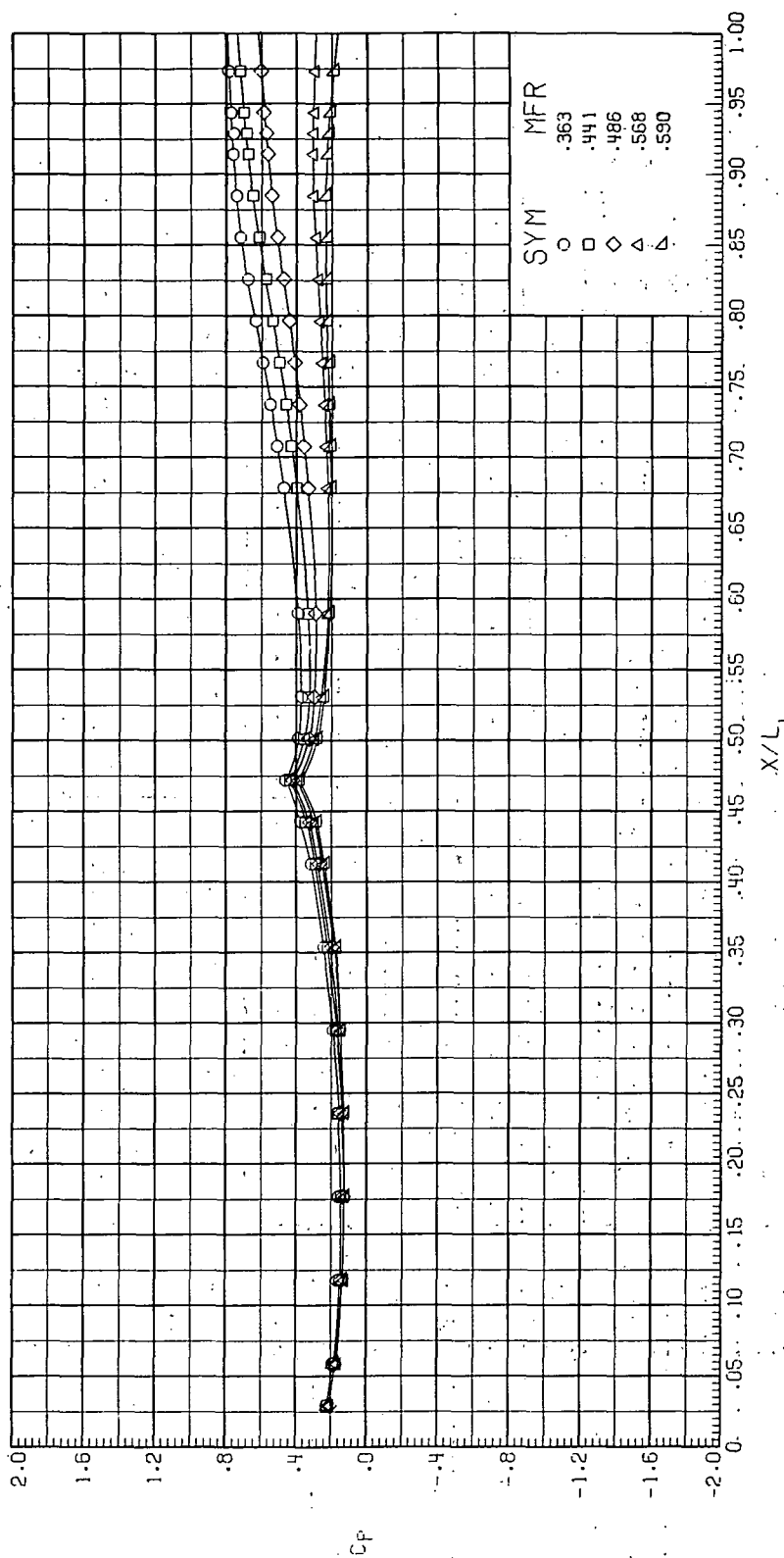
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



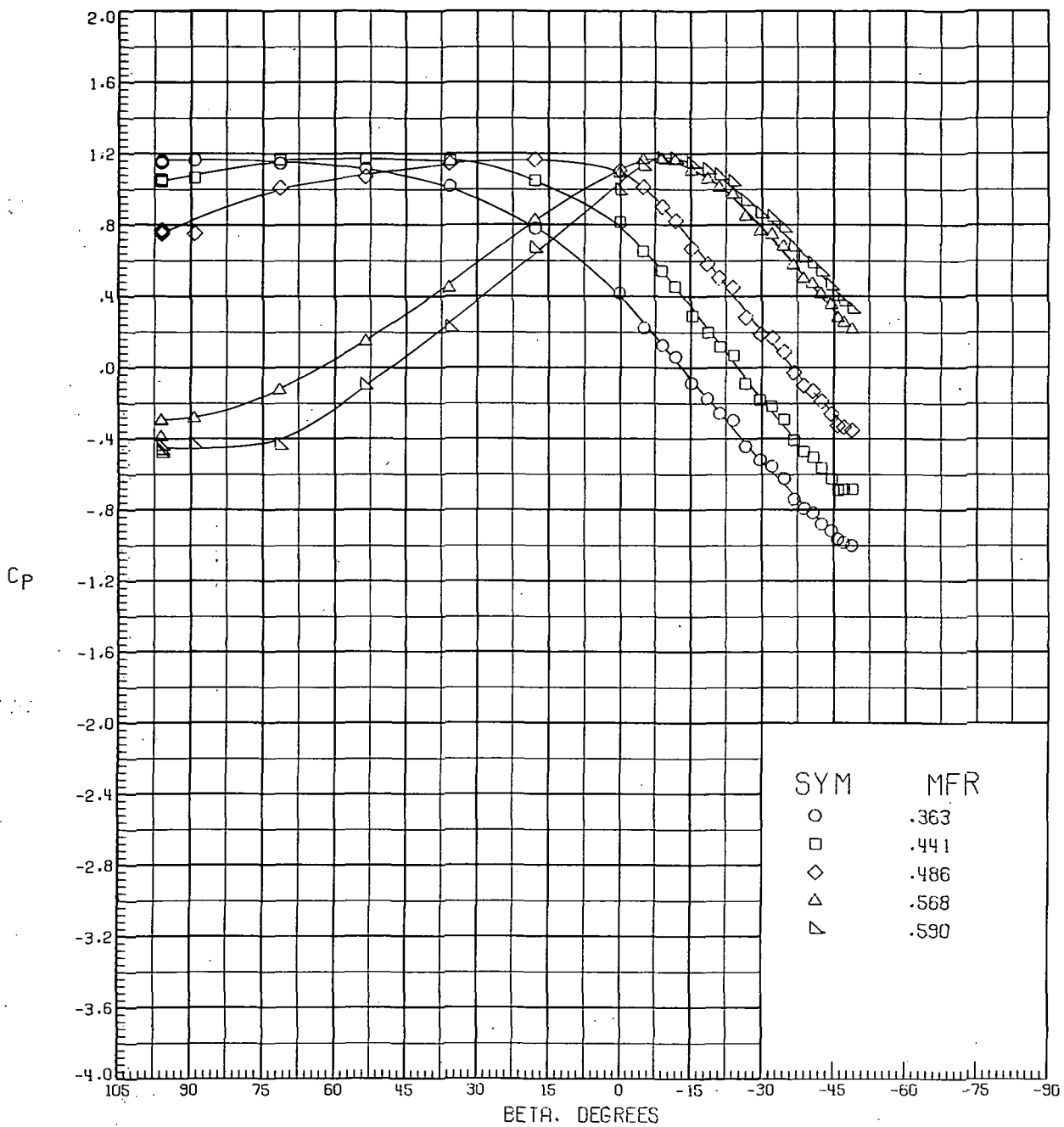
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27.- Continued.



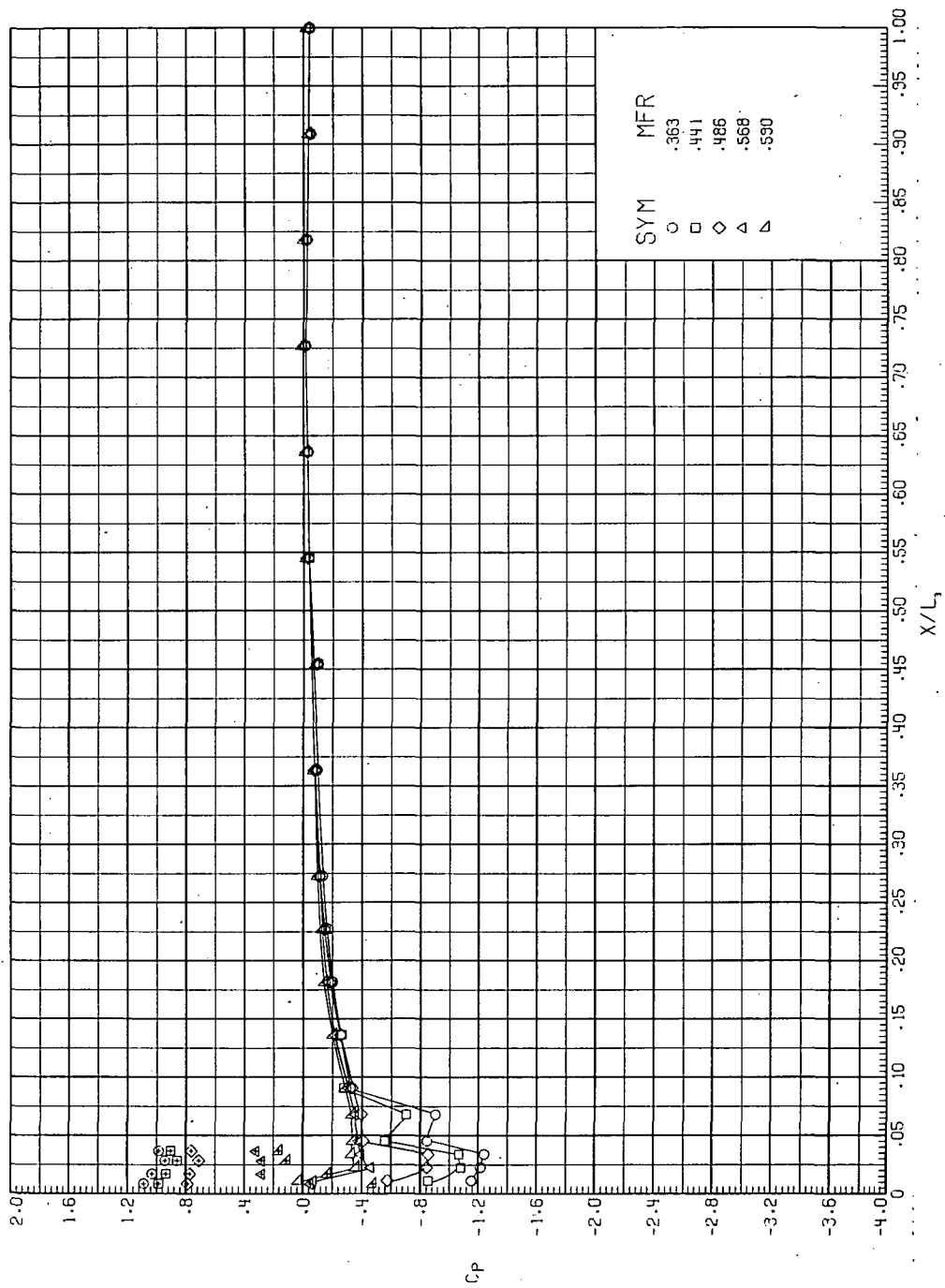
(d) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 27. - Continued.



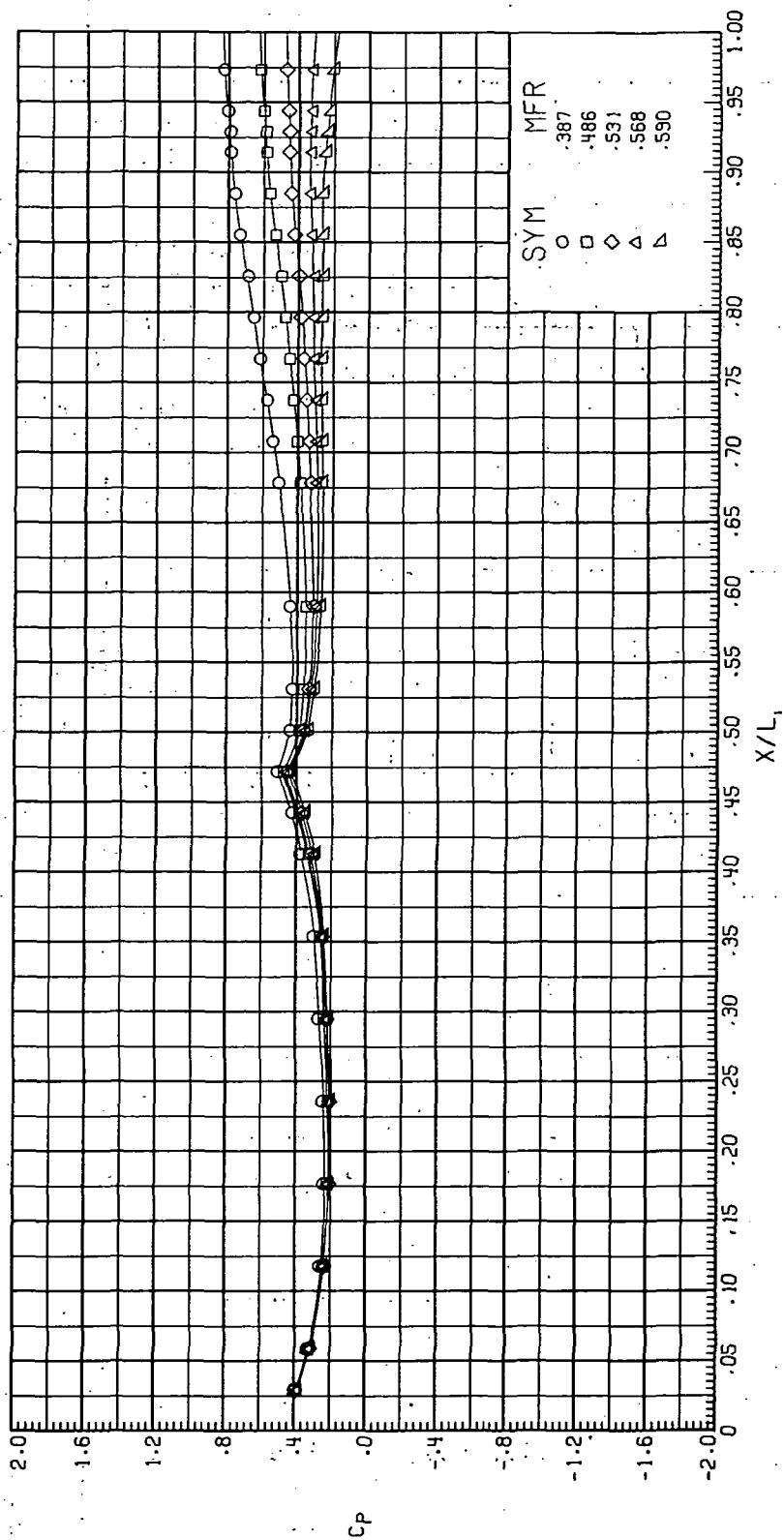
(d) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



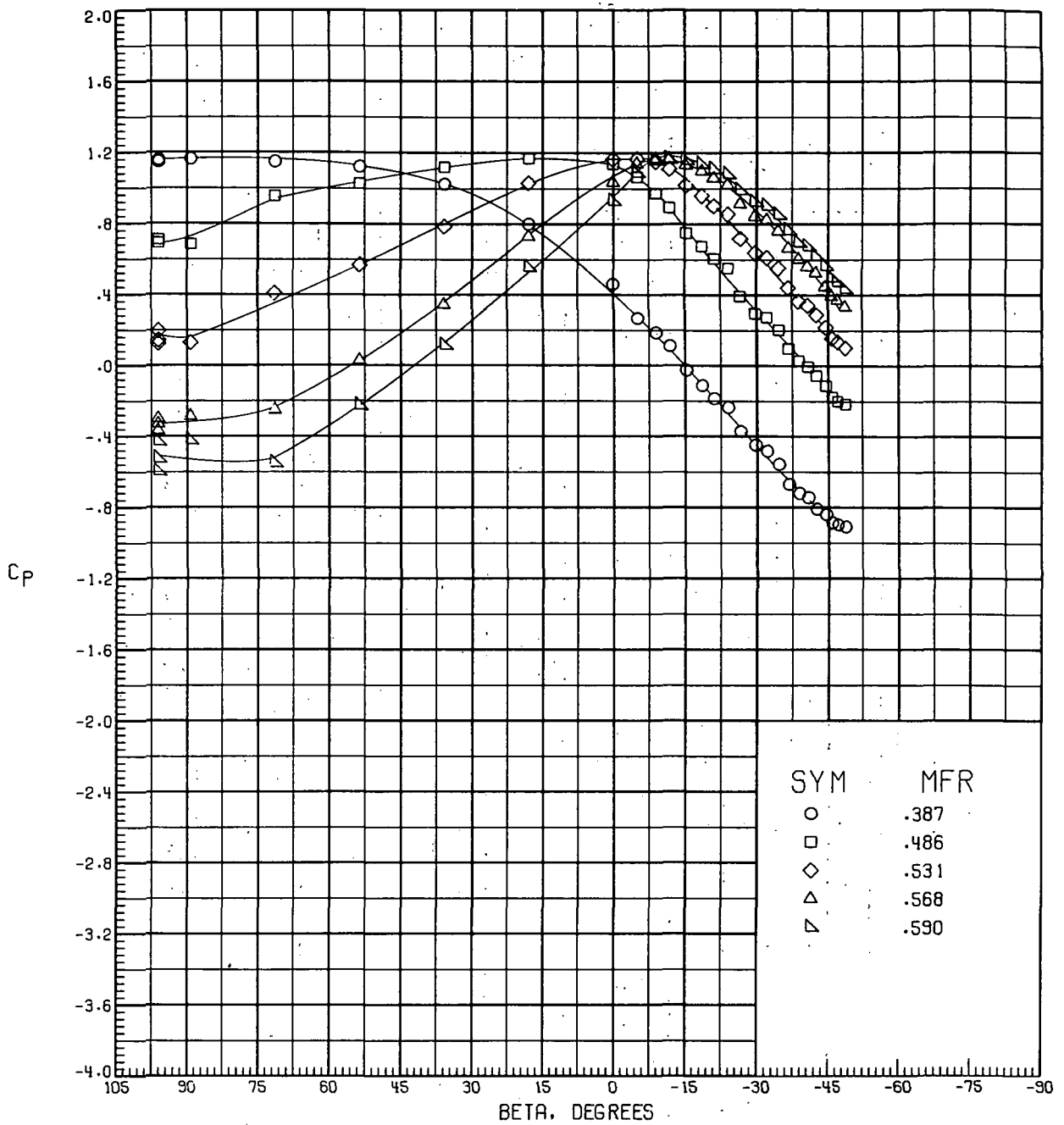
(d) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27. - Continued.



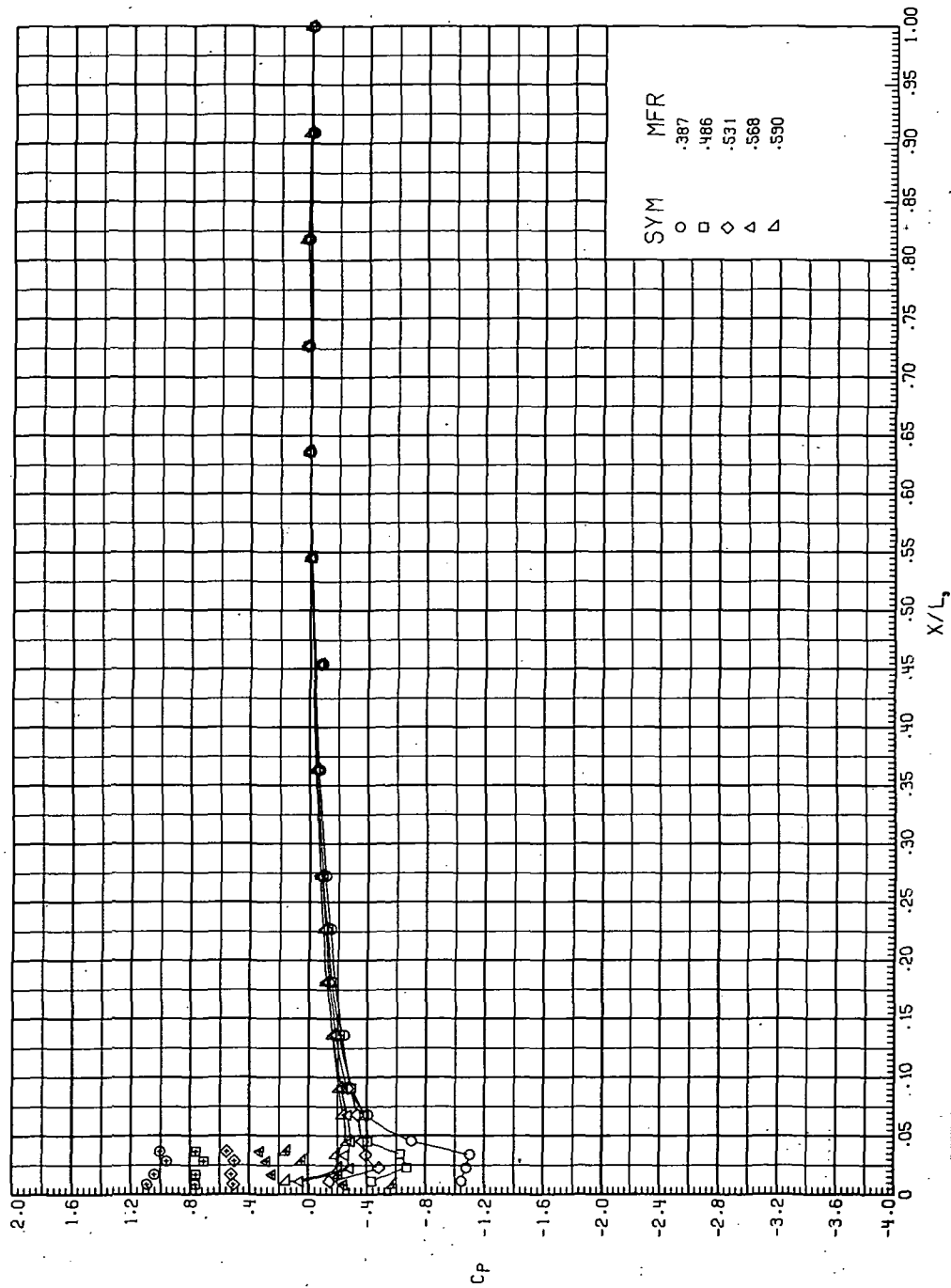
(e) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 27. - Continued.



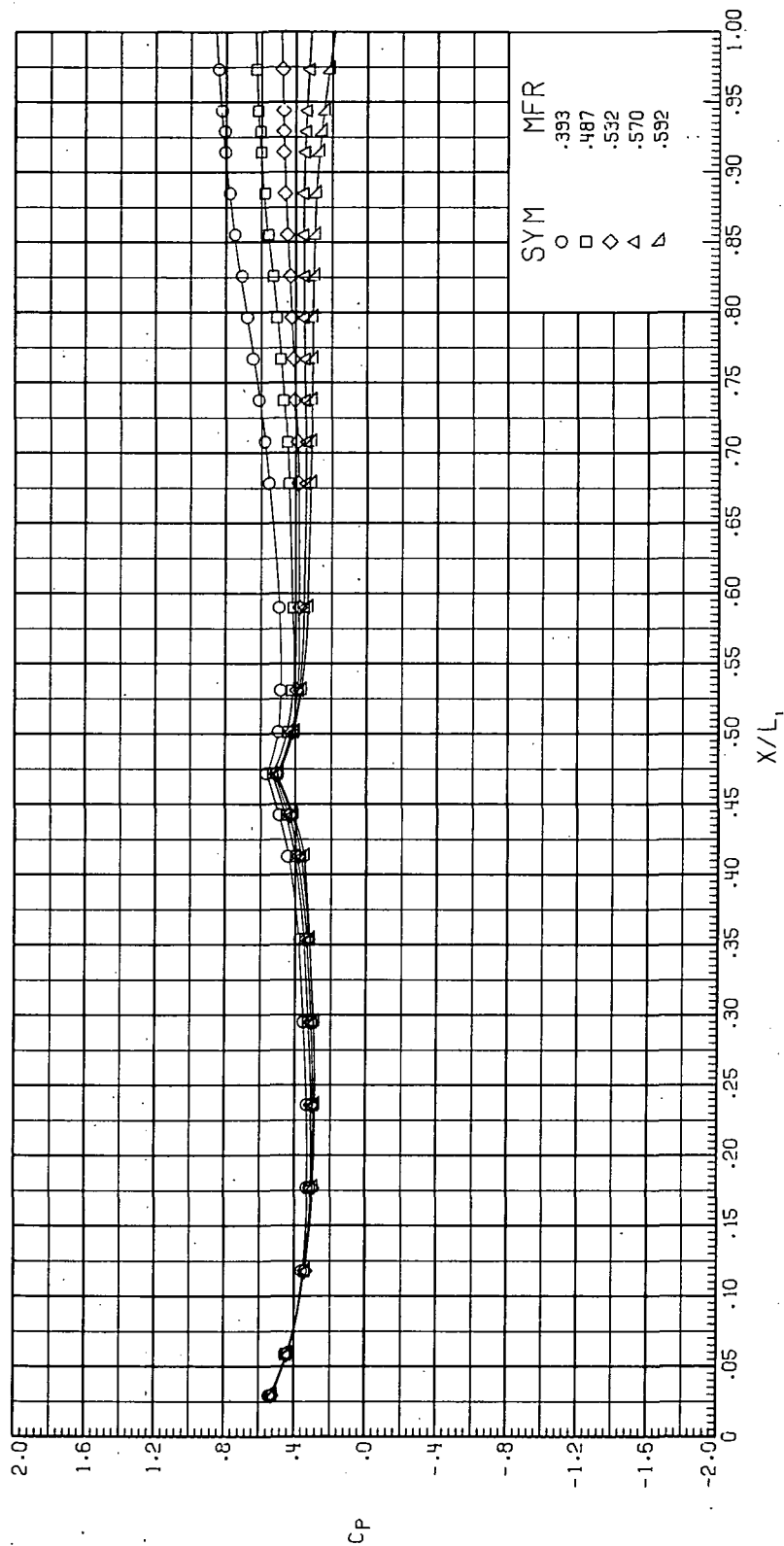
(e) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



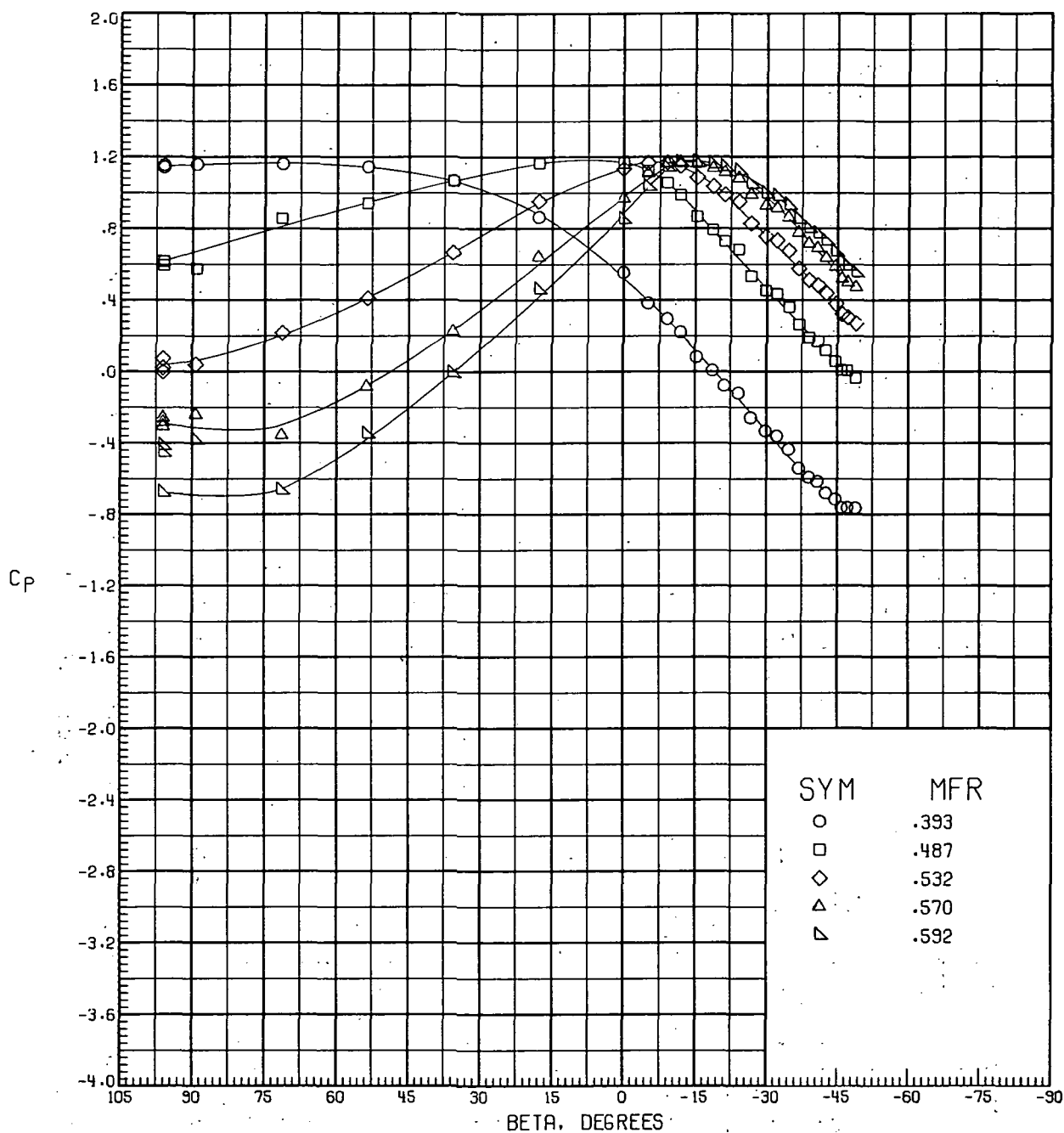
(e) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27.- Continued.



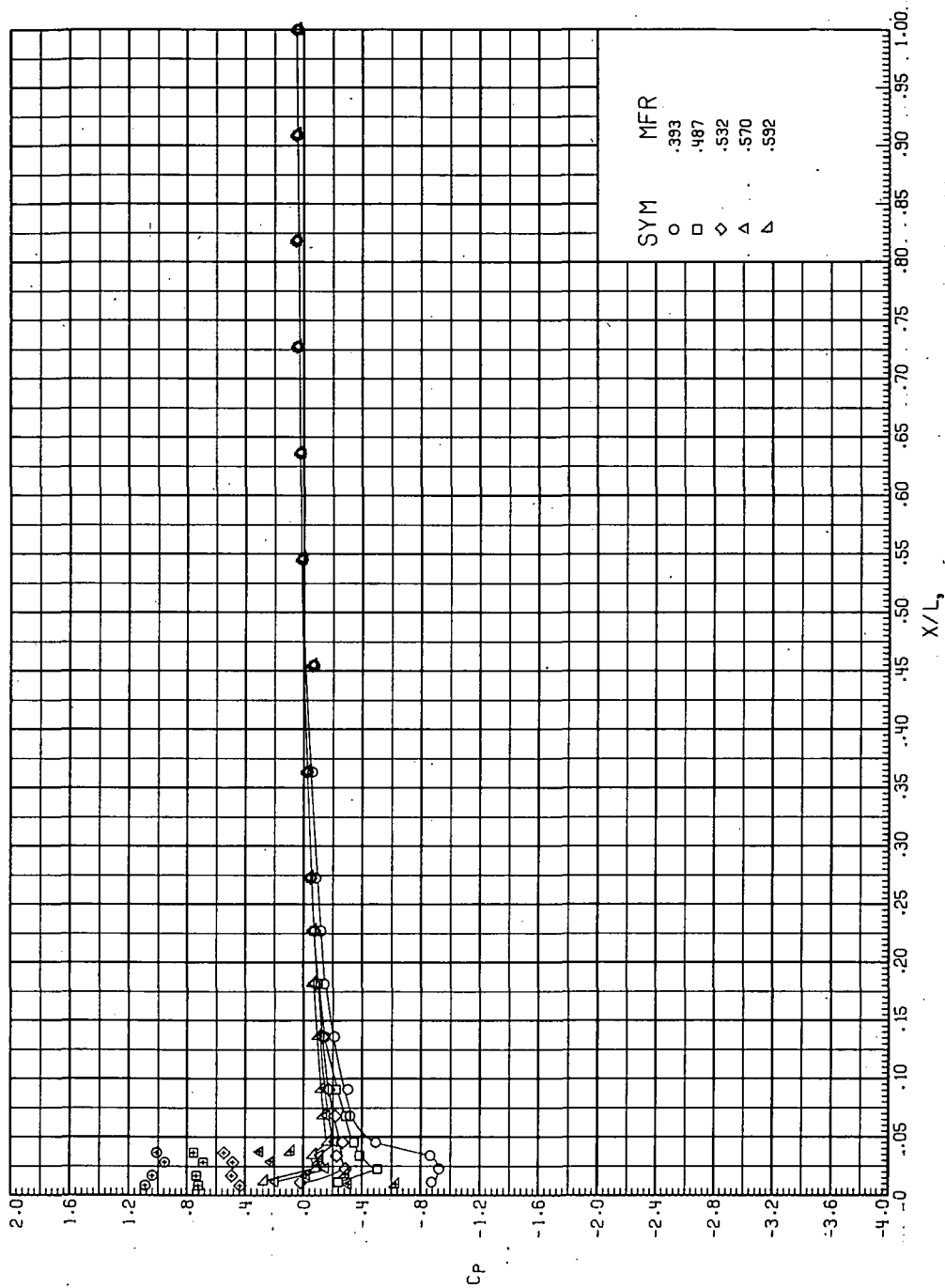
(f) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 27.- Continued.



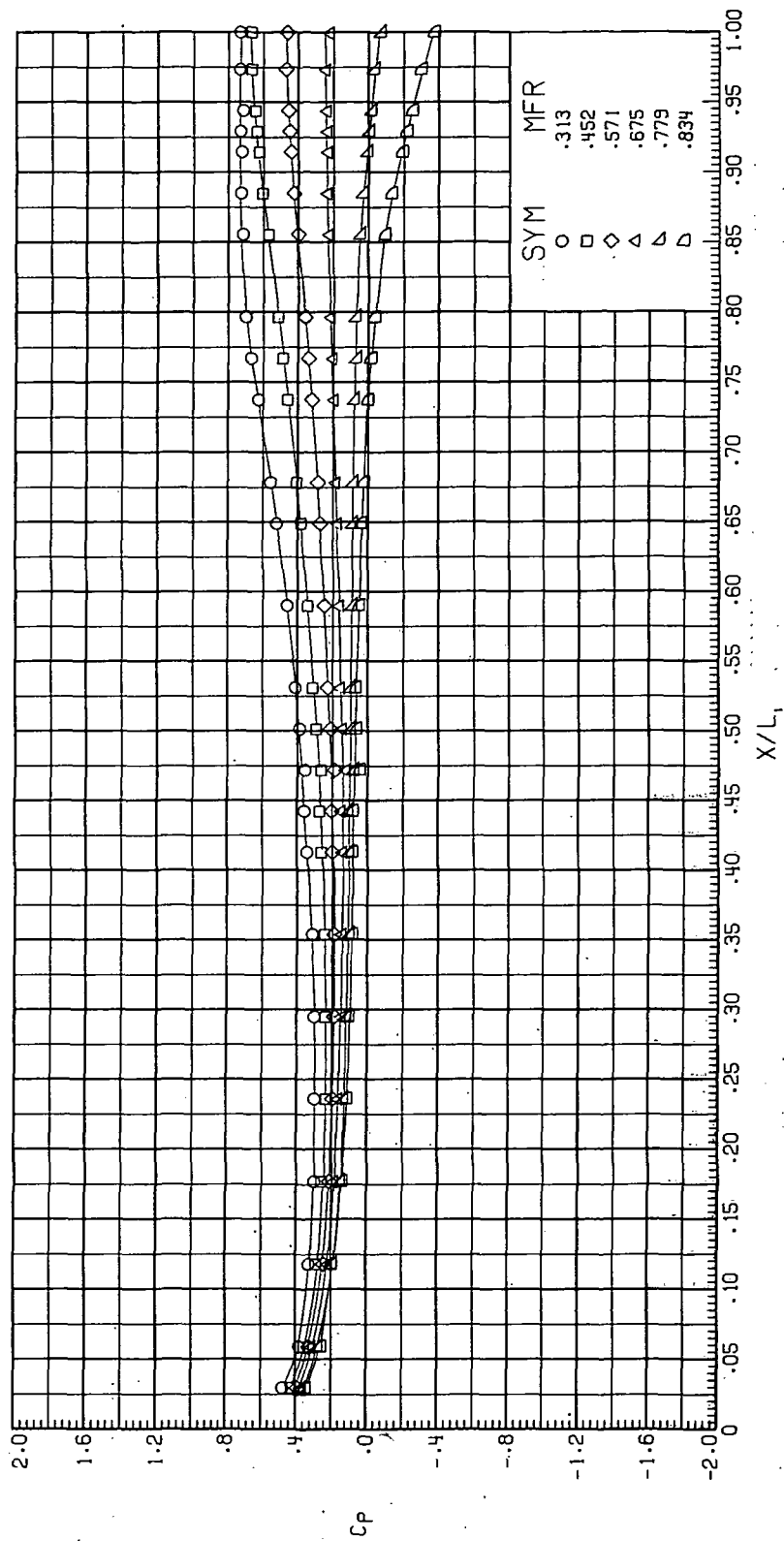
(f) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 27.- Continued.



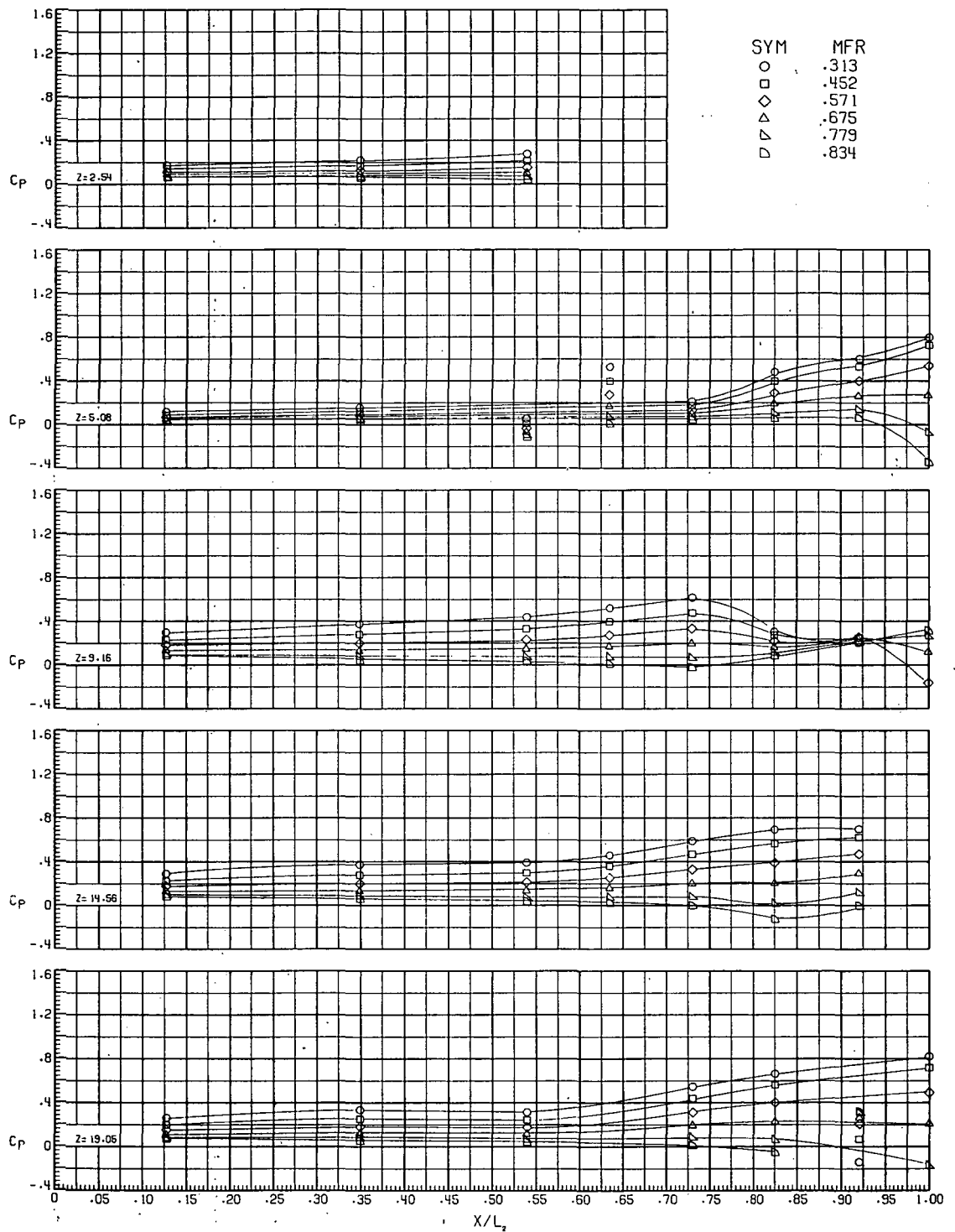
(f) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 27. - Concluded.



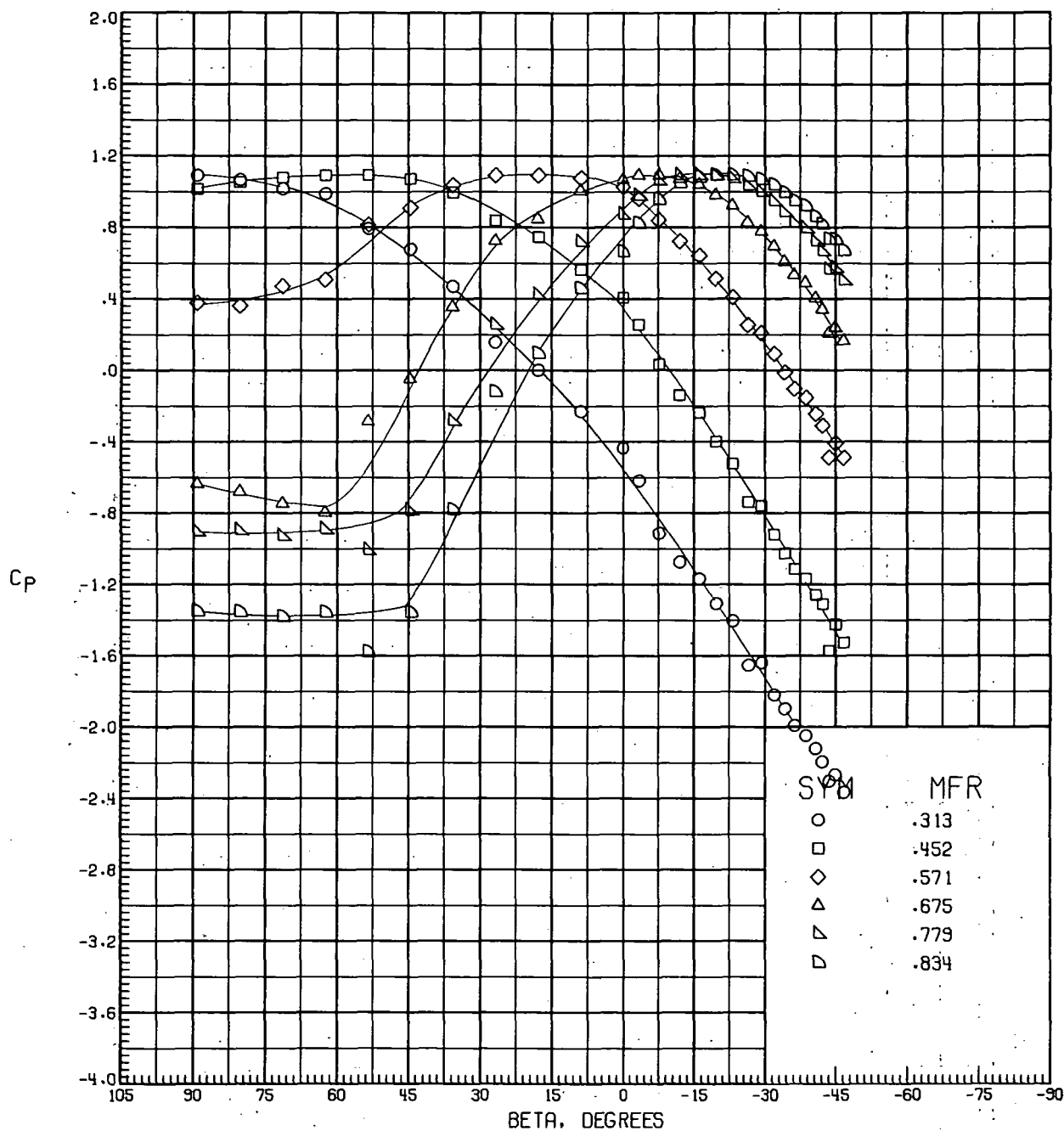
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 28.- Pressure coefficients for cowl 90-2. $\delta_1 = \delta_2 = 5^\circ$.



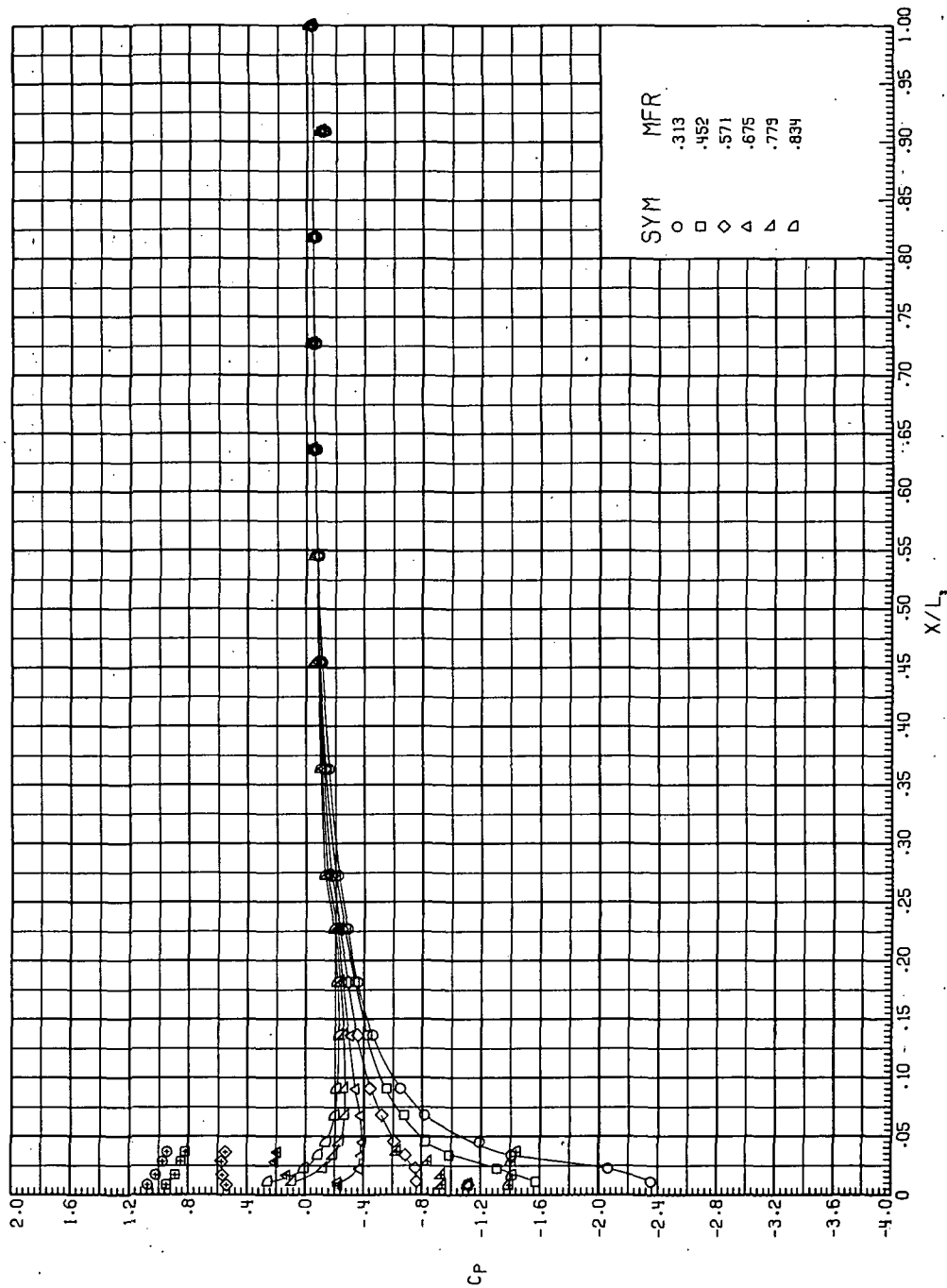
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



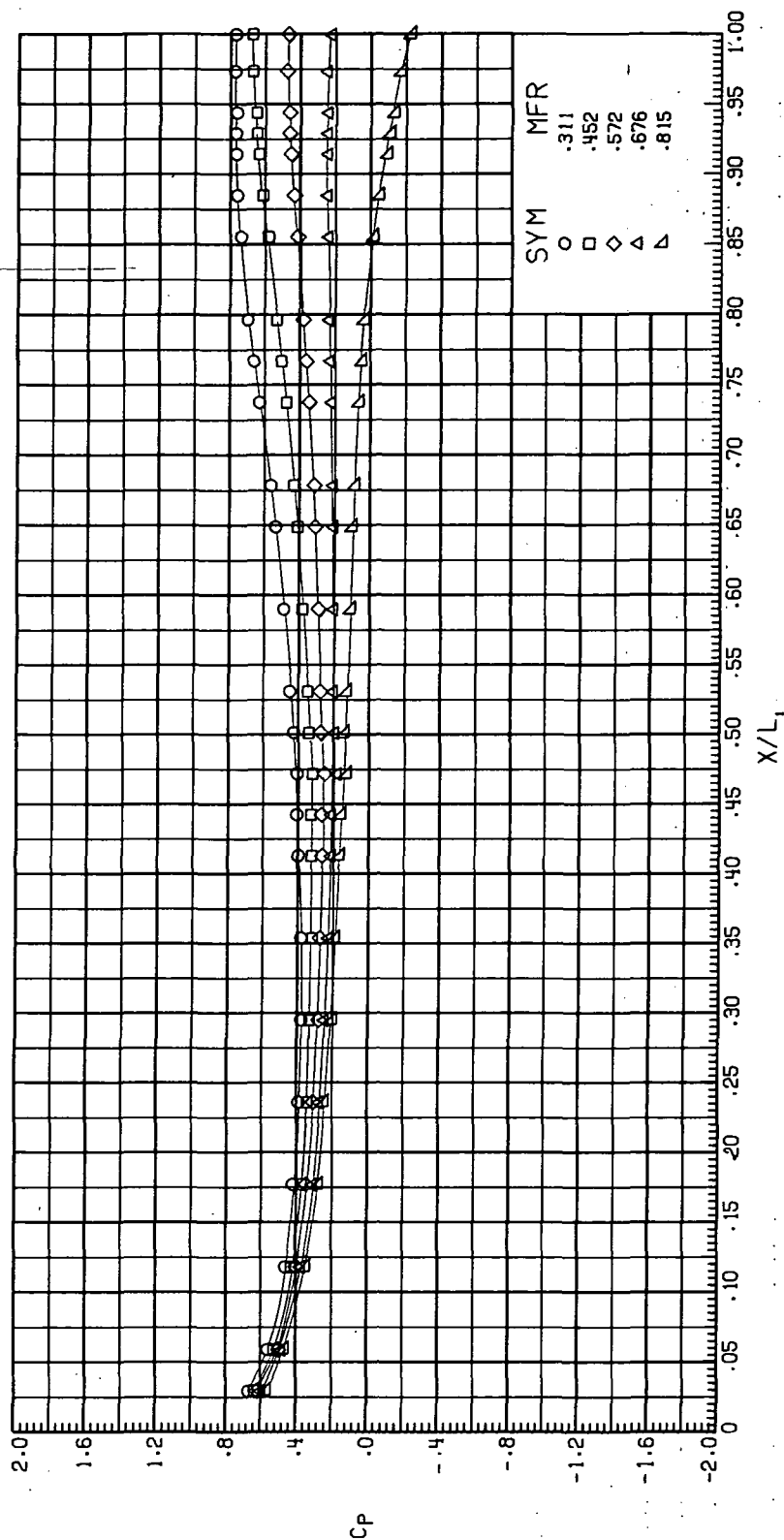
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



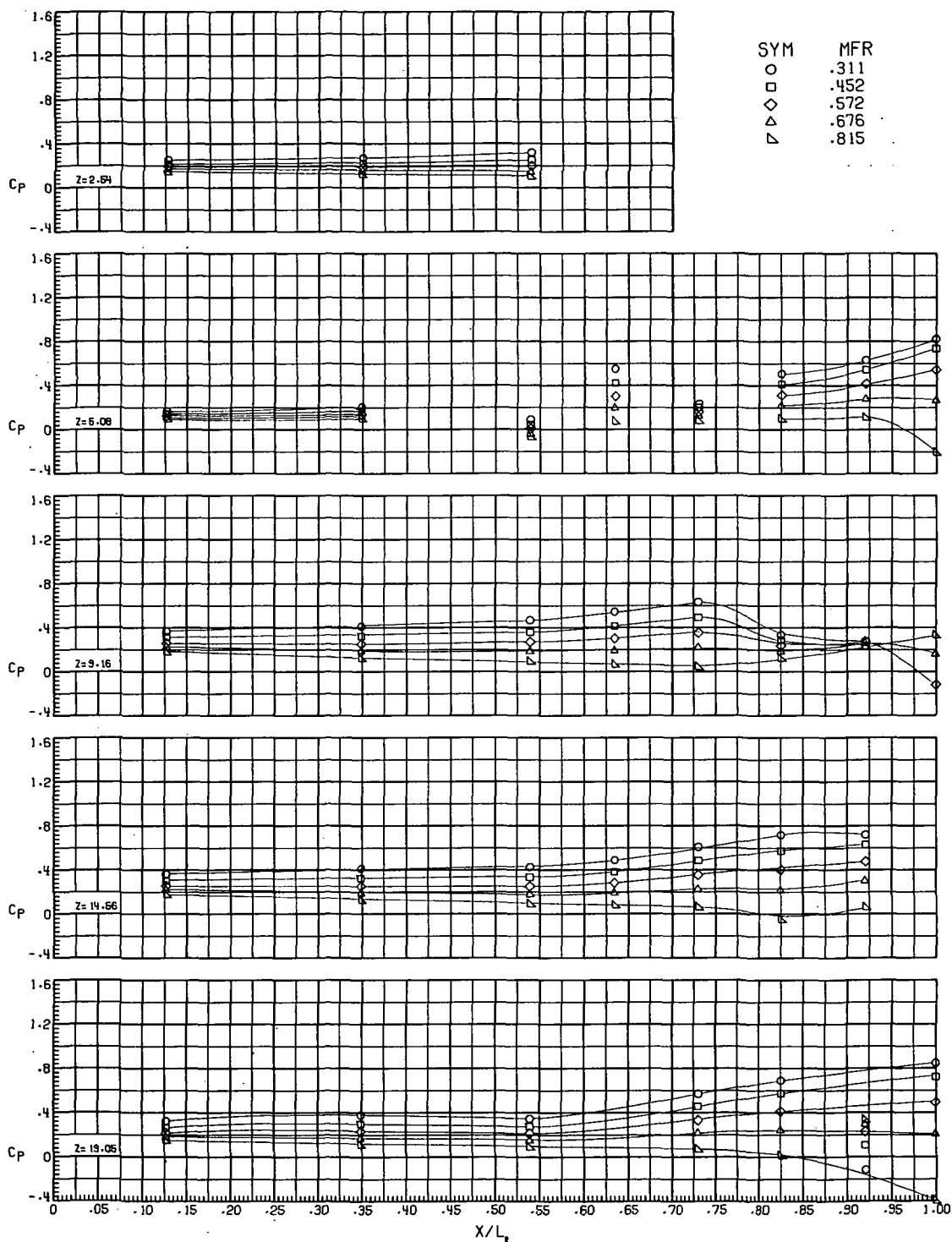
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28.- Continued.



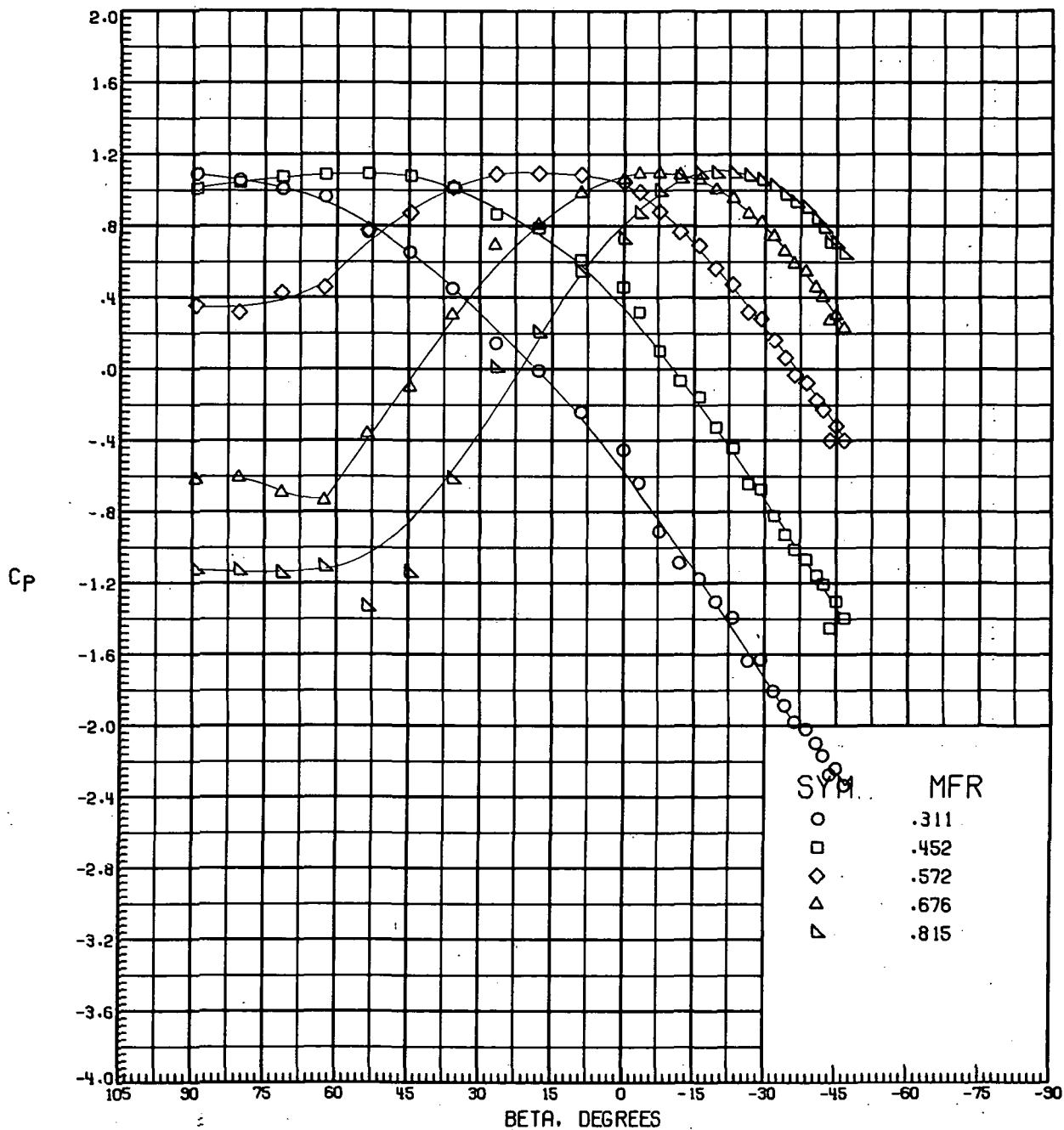
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



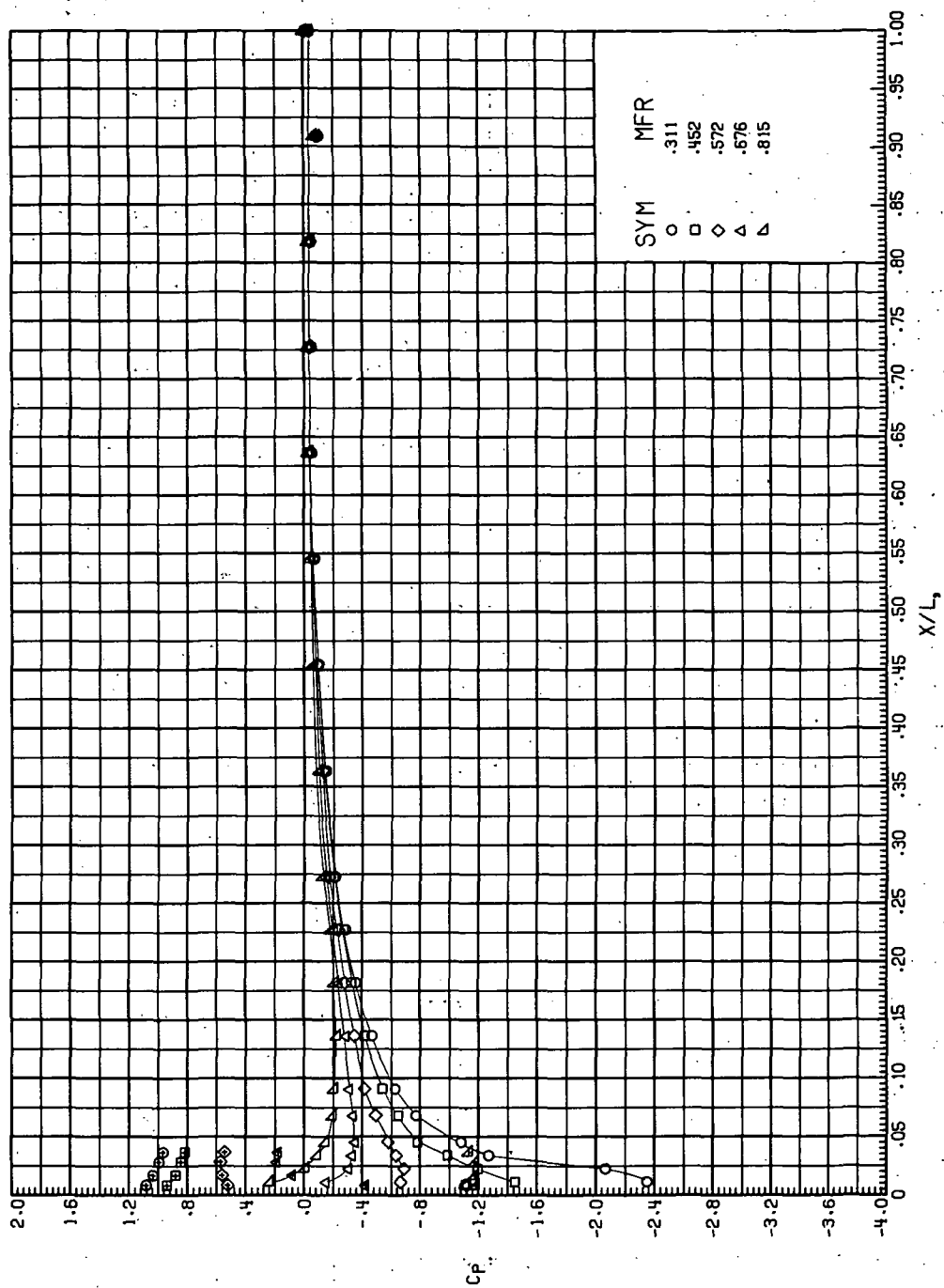
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



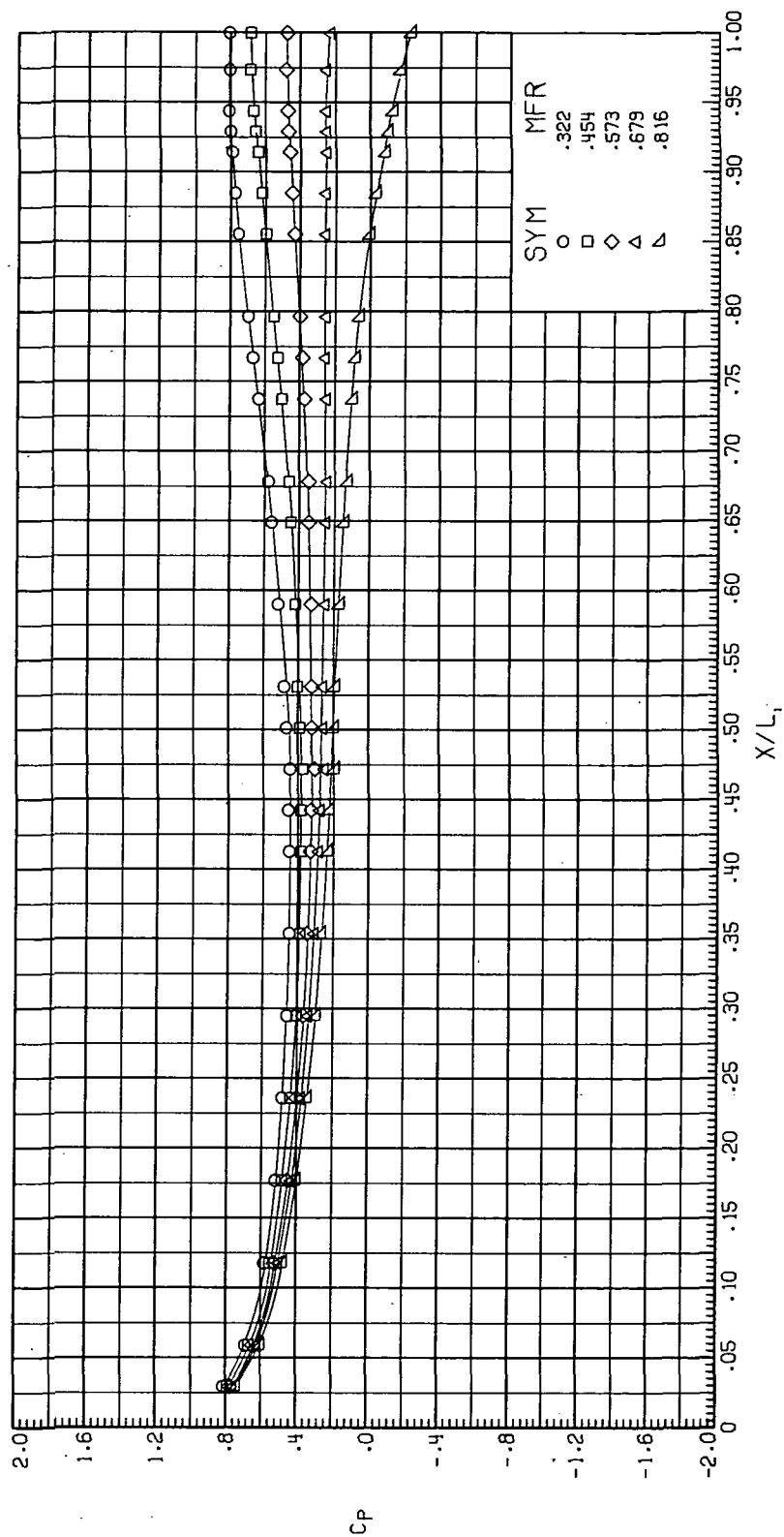
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



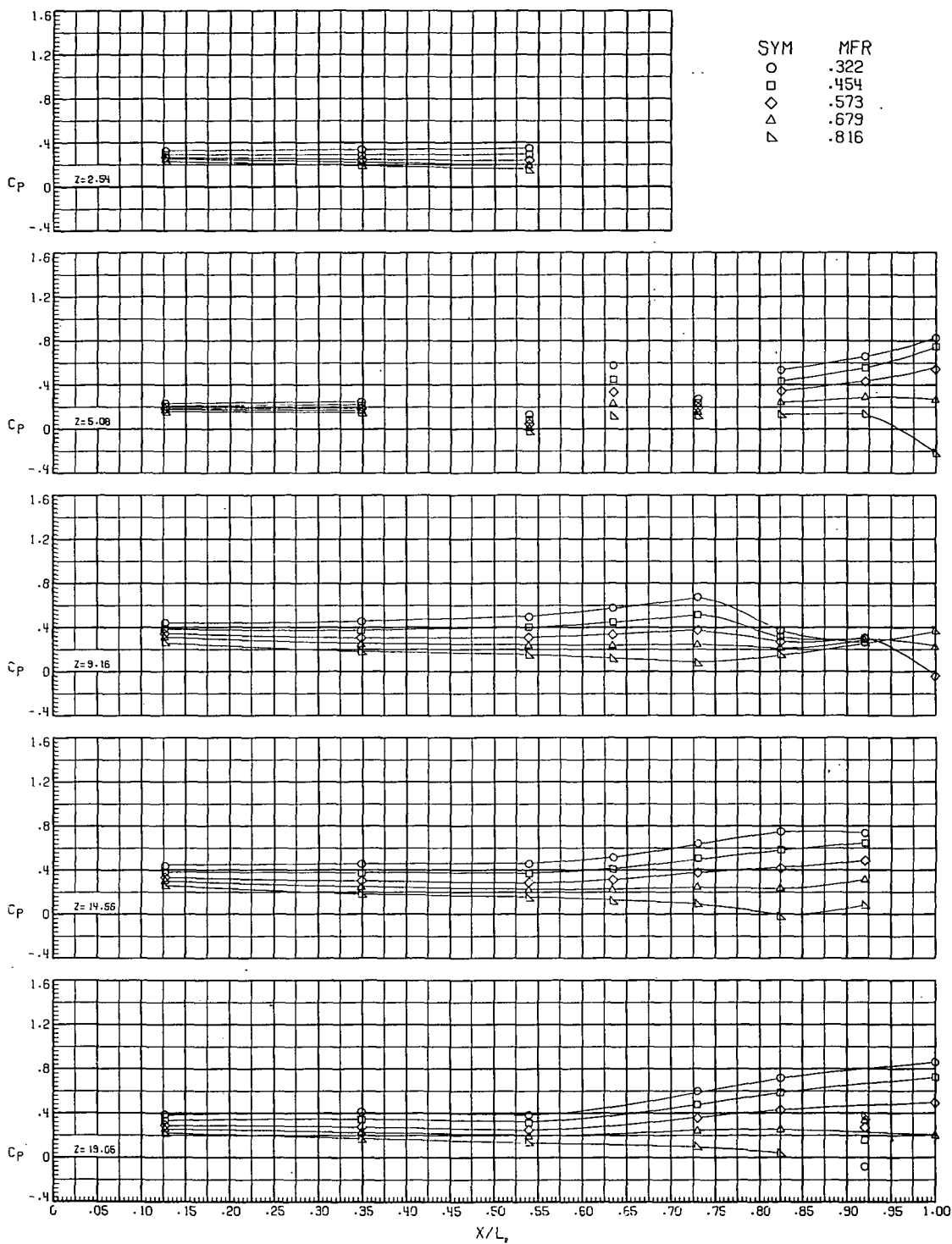
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28. - Continued.



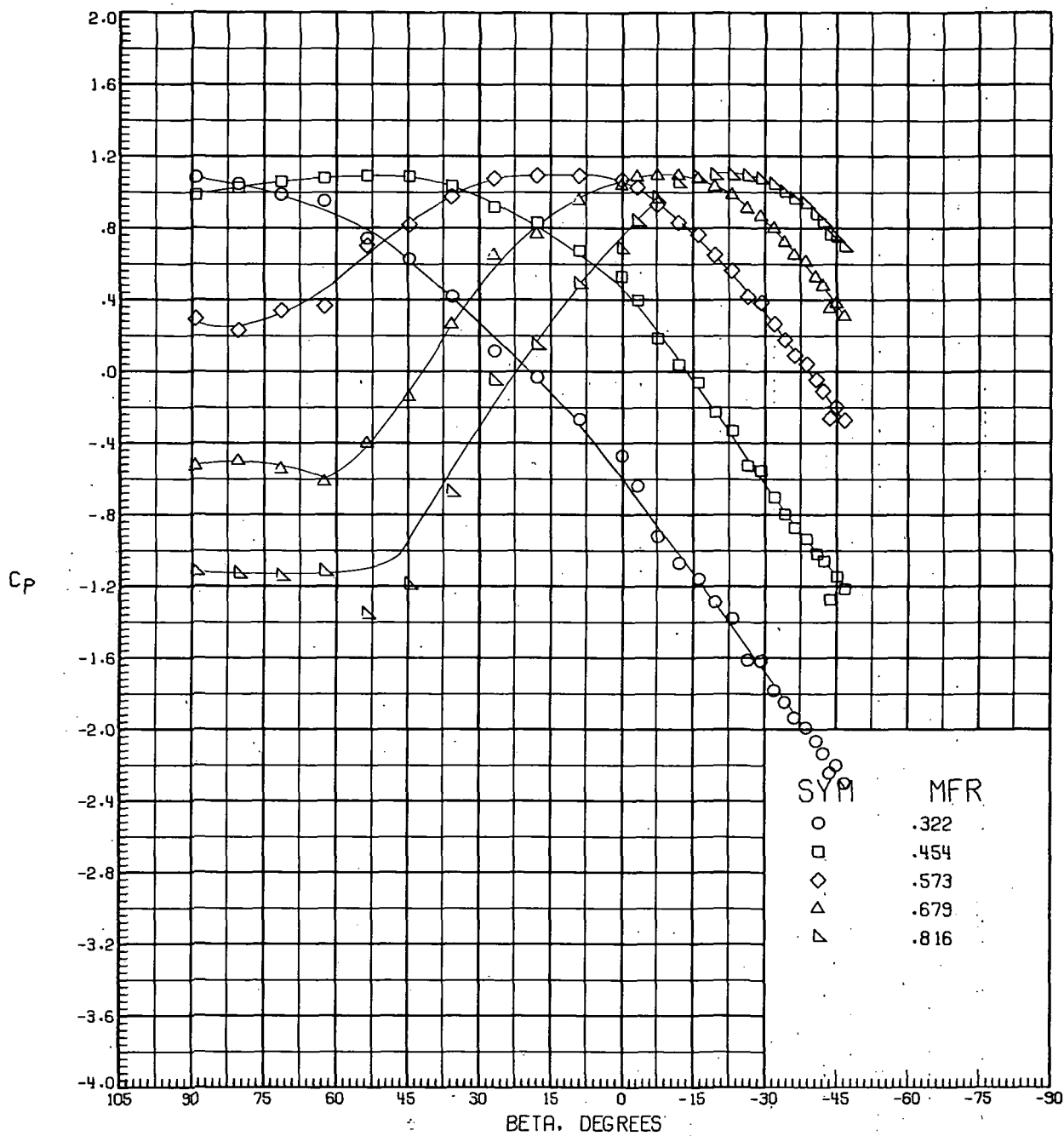
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



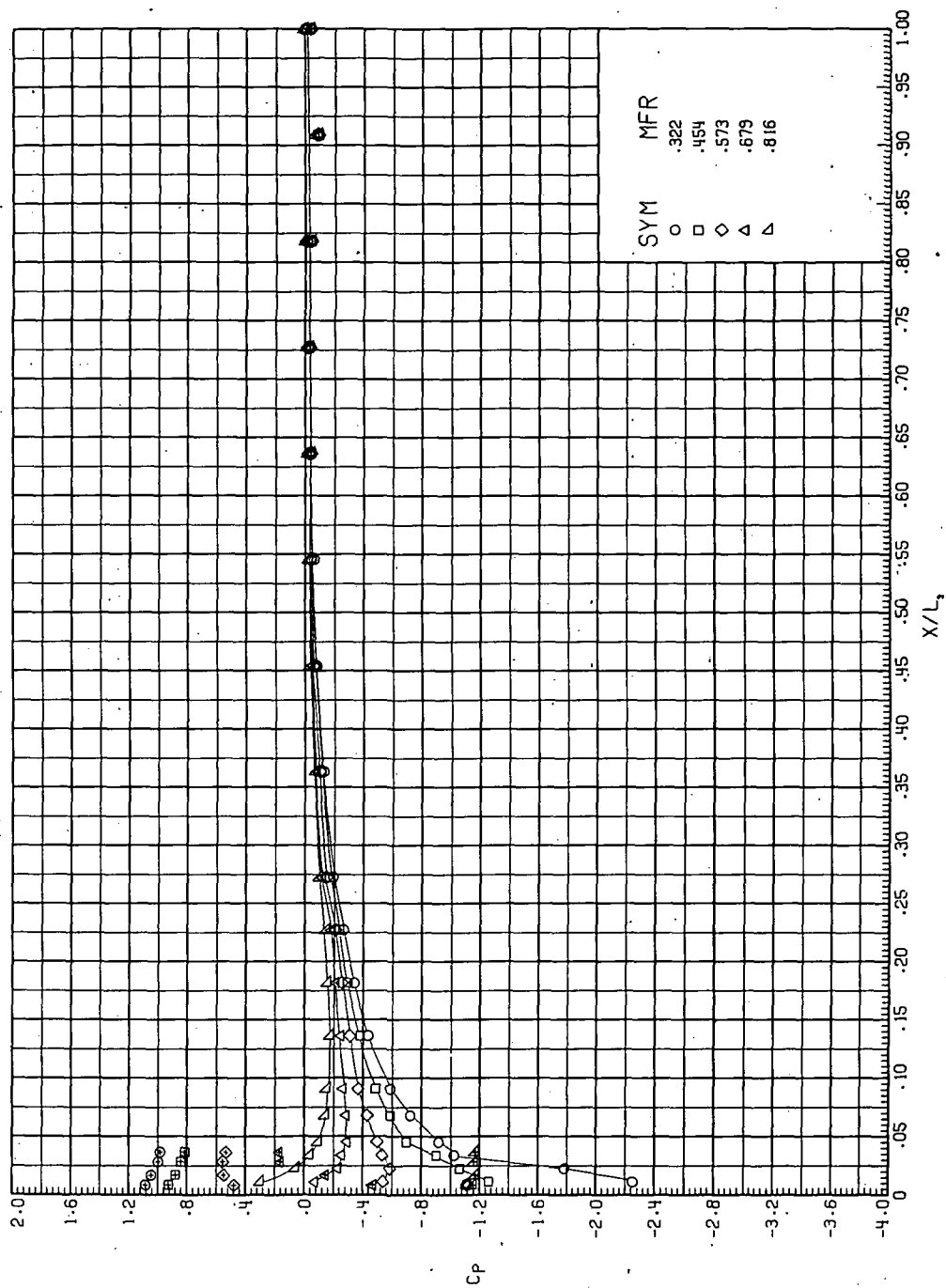
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



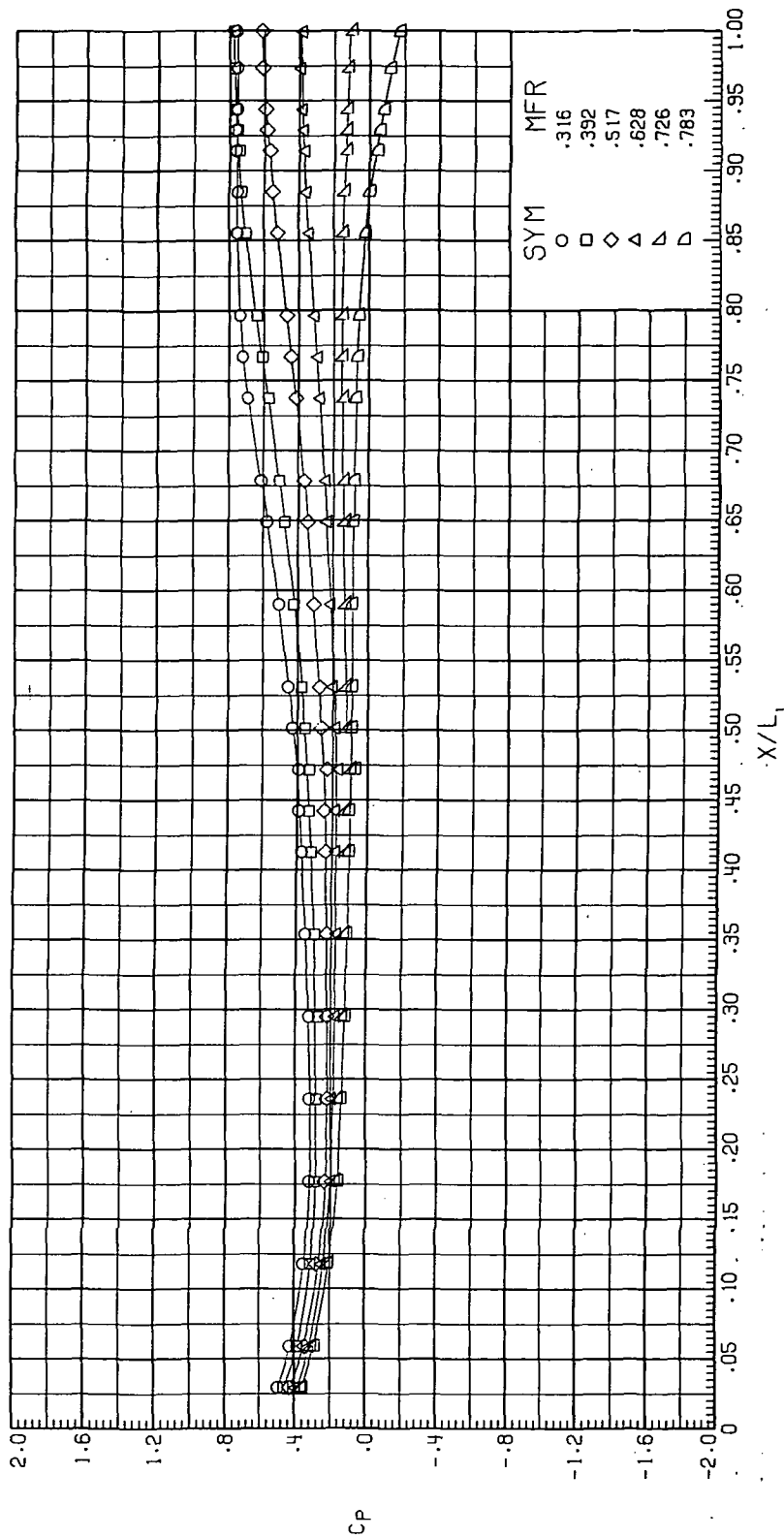
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



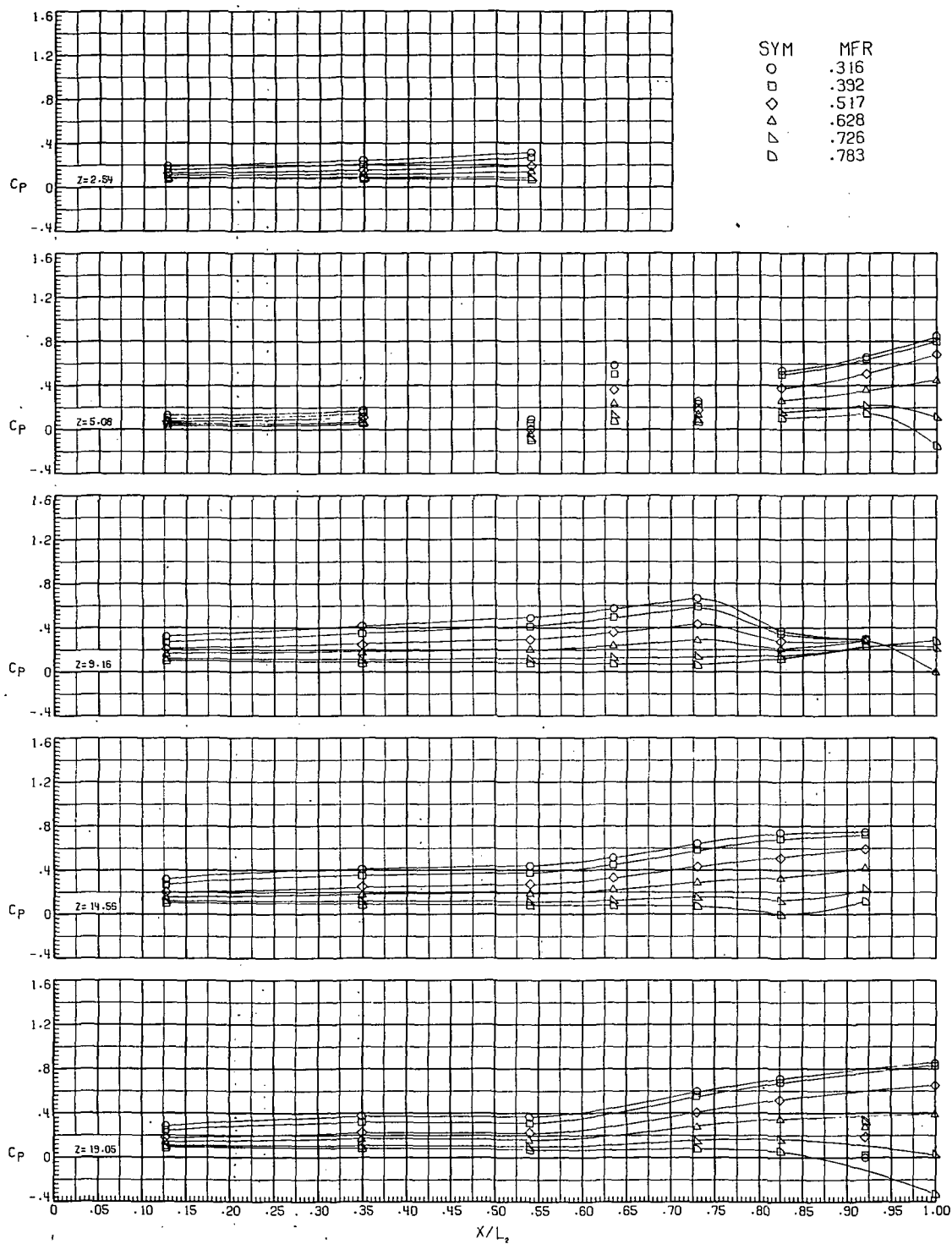
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28.- Continued.



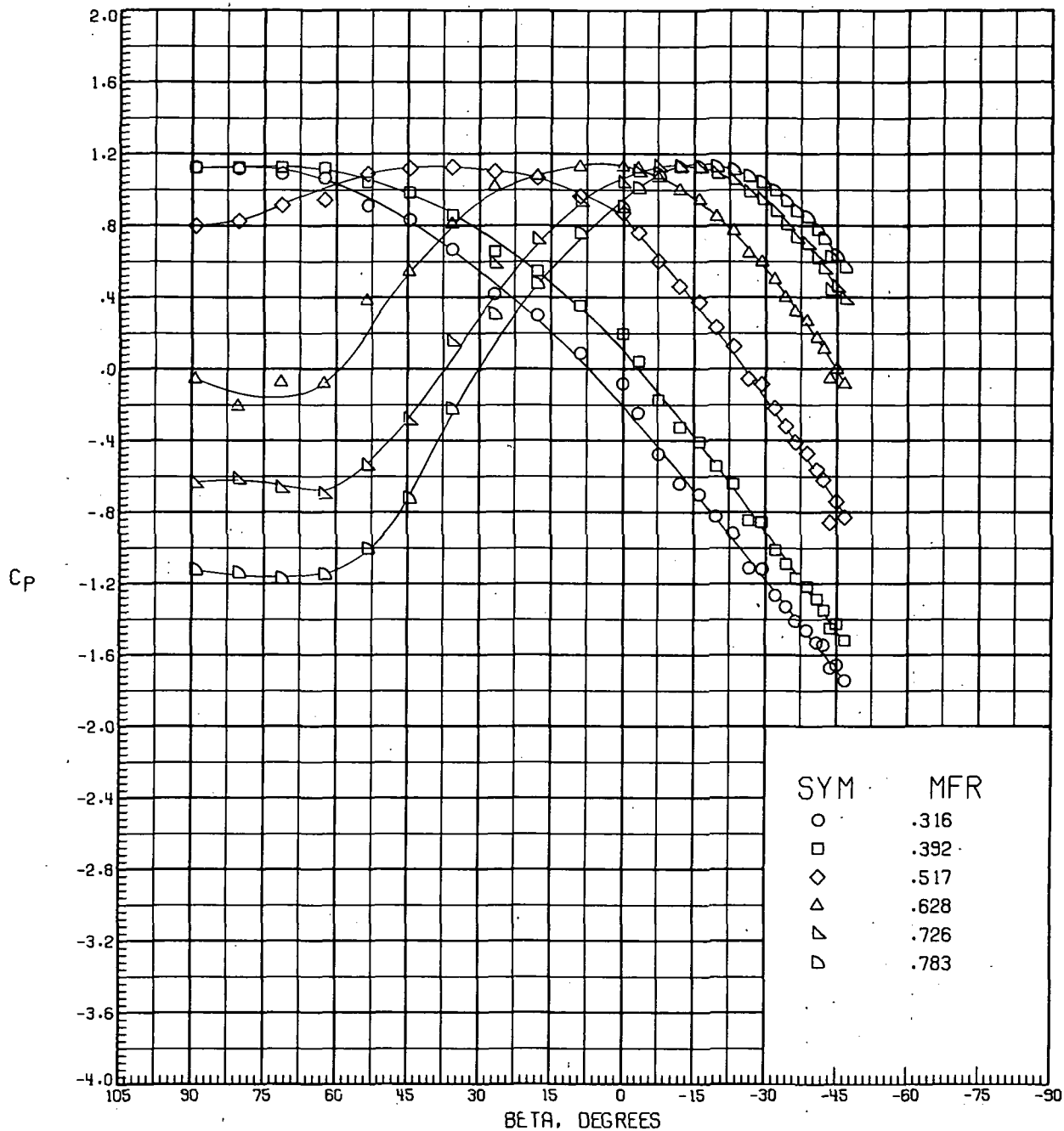
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



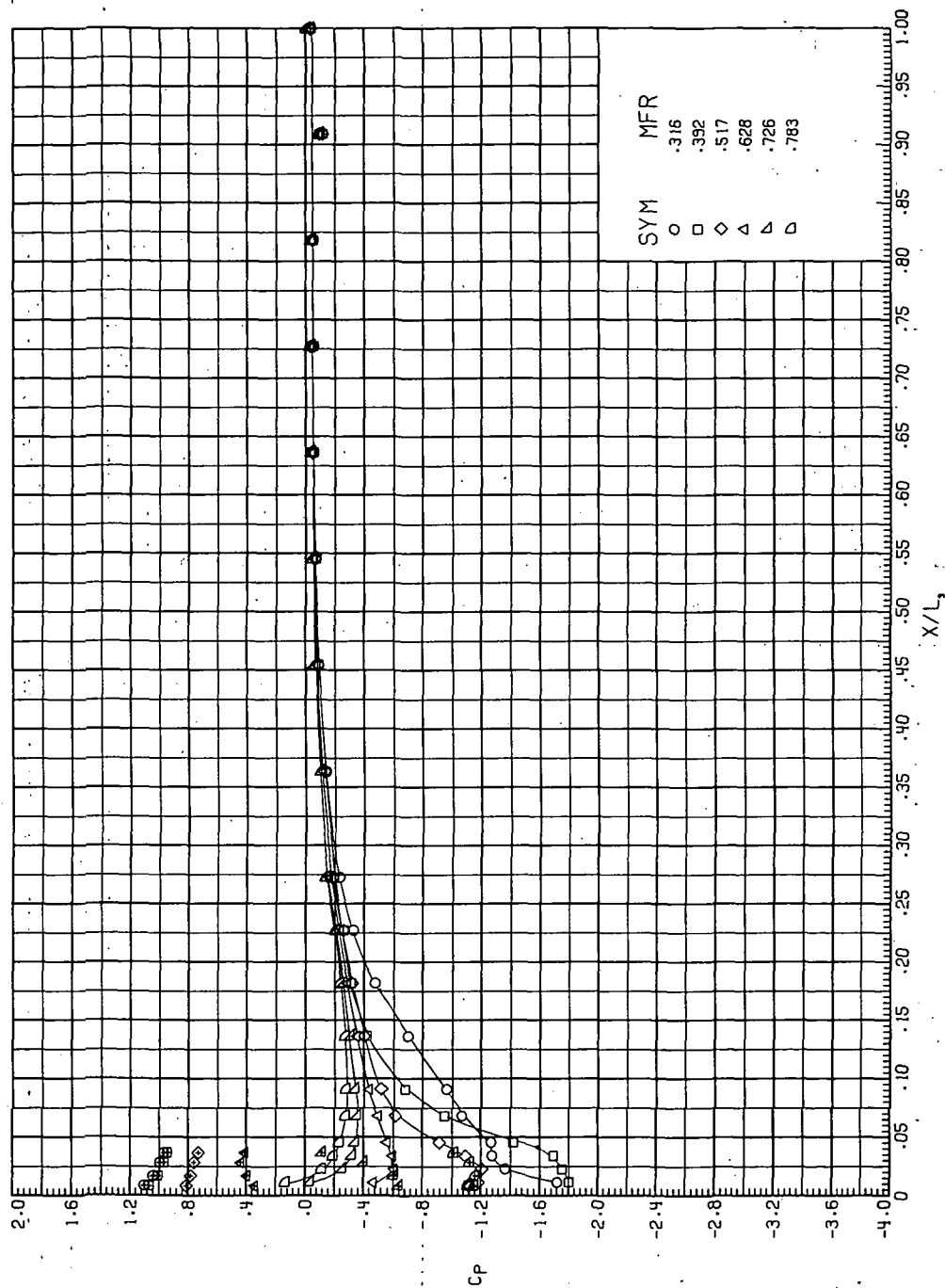
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



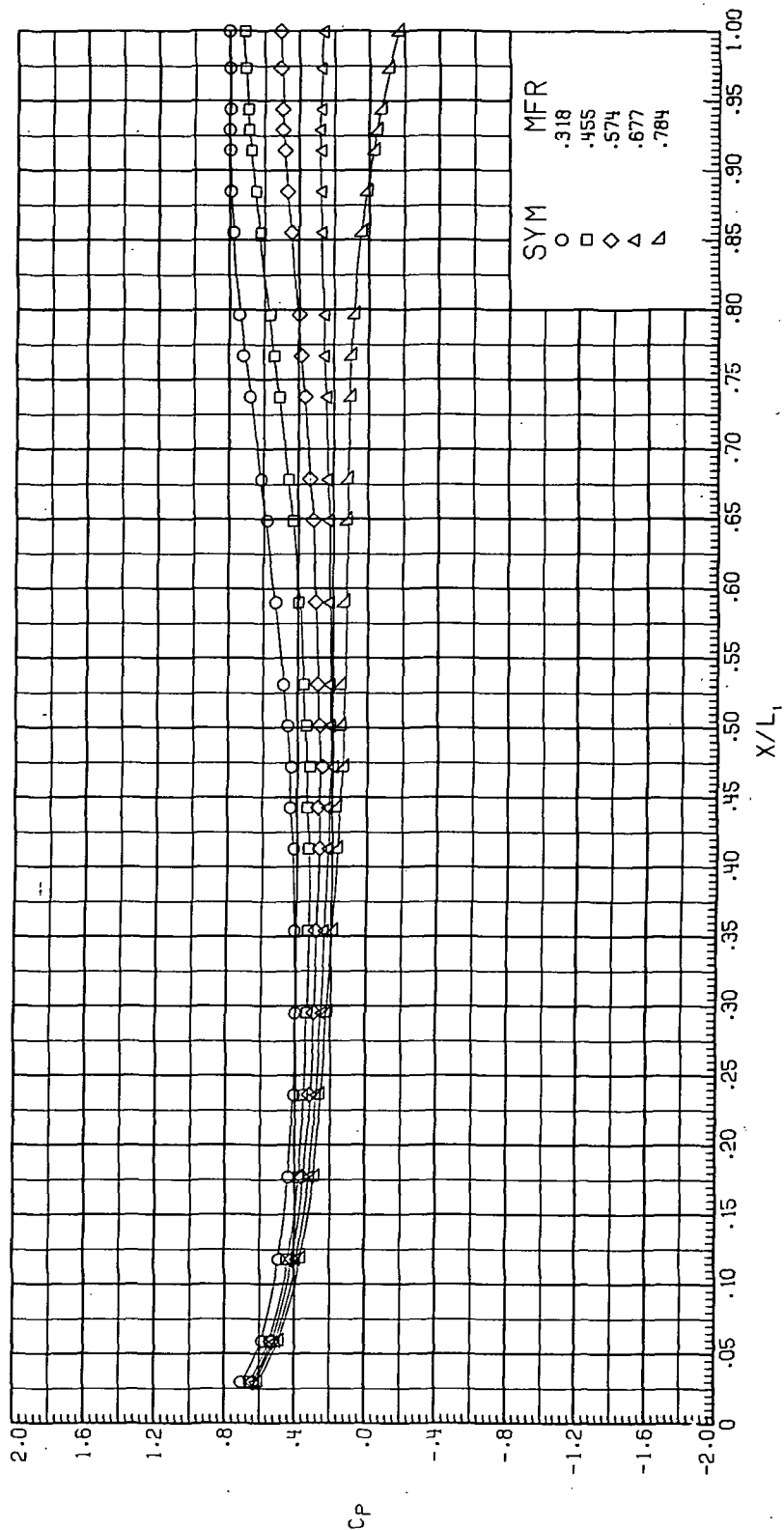
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



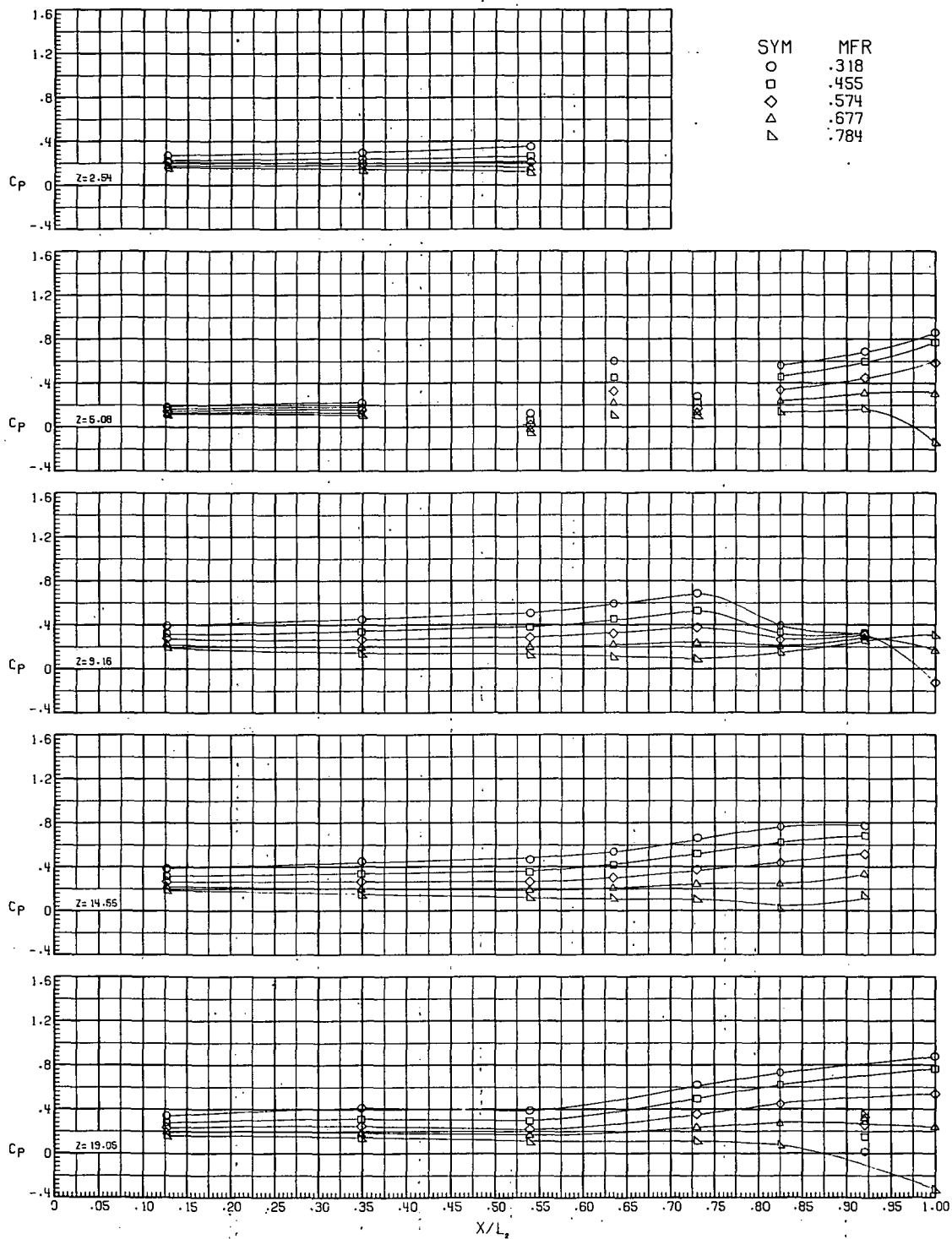
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28. - Continued.



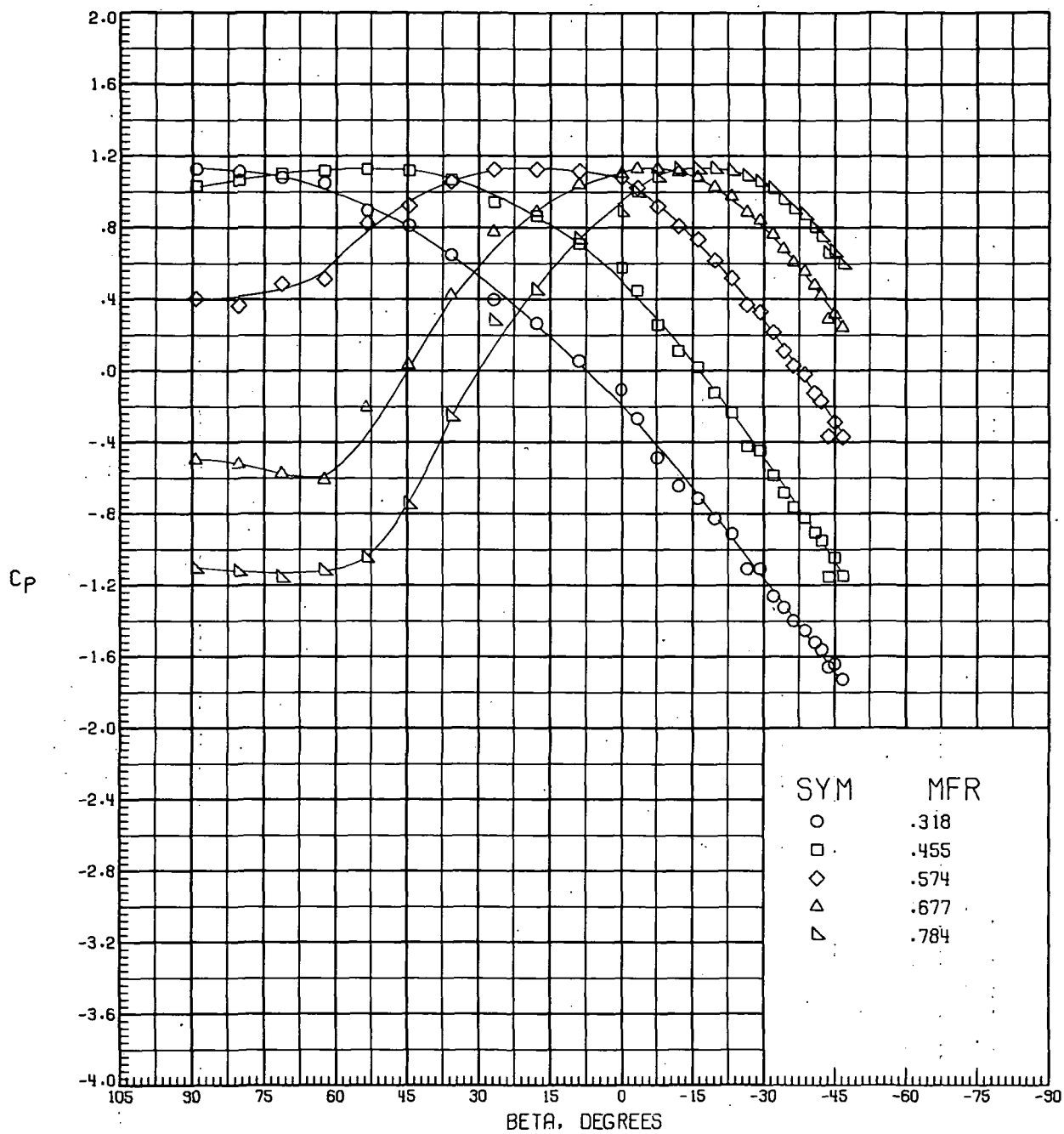
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



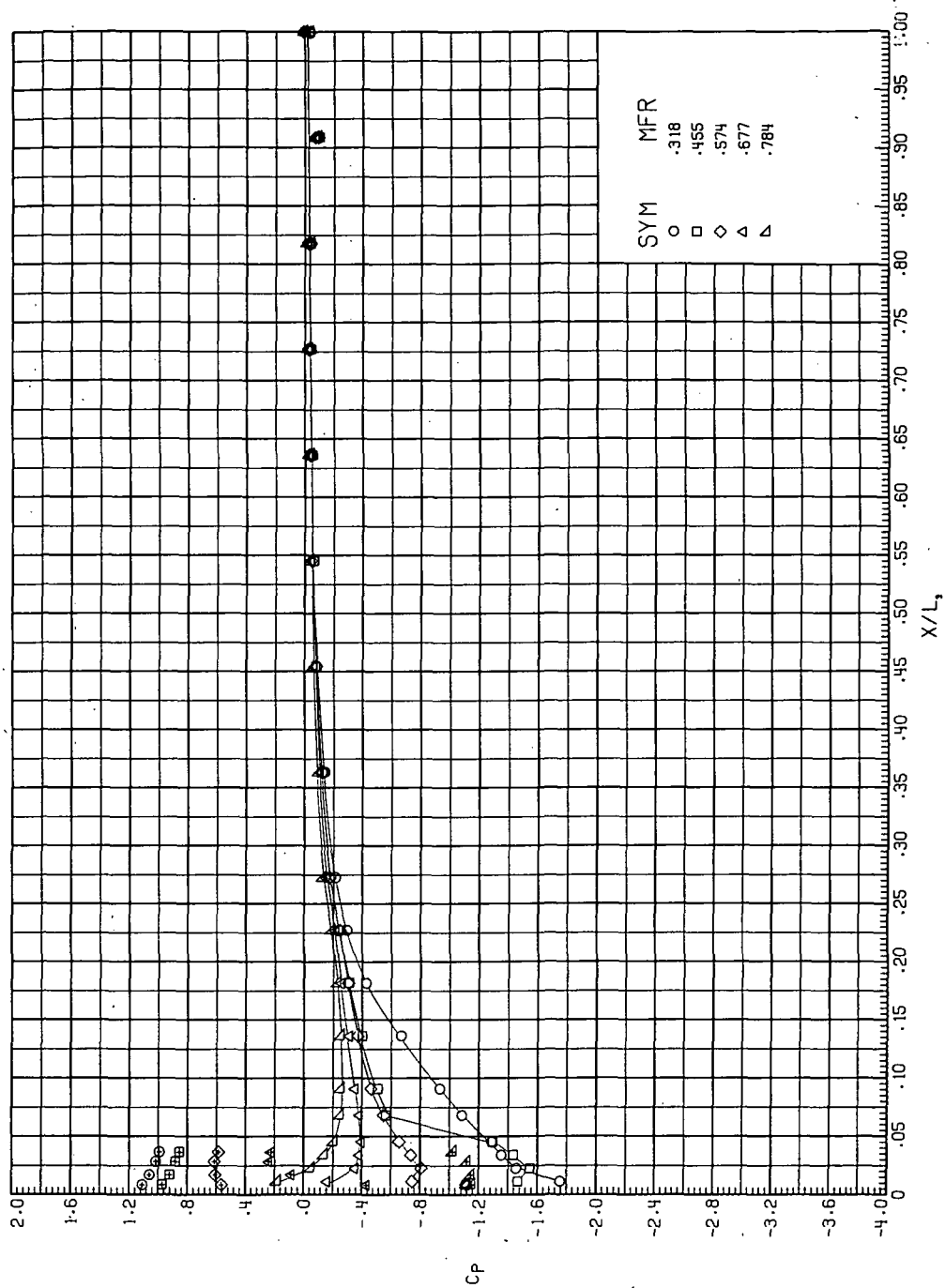
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



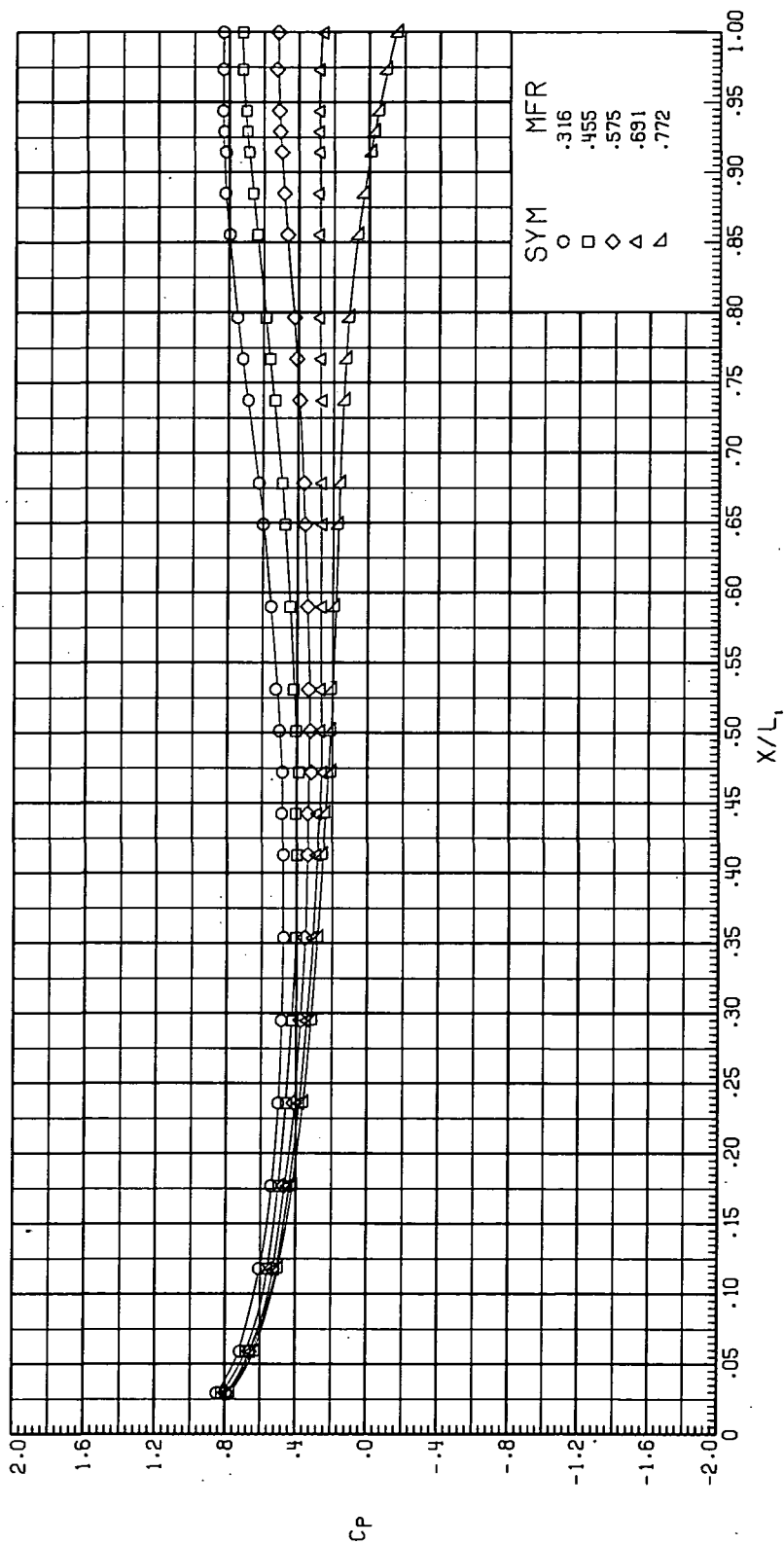
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



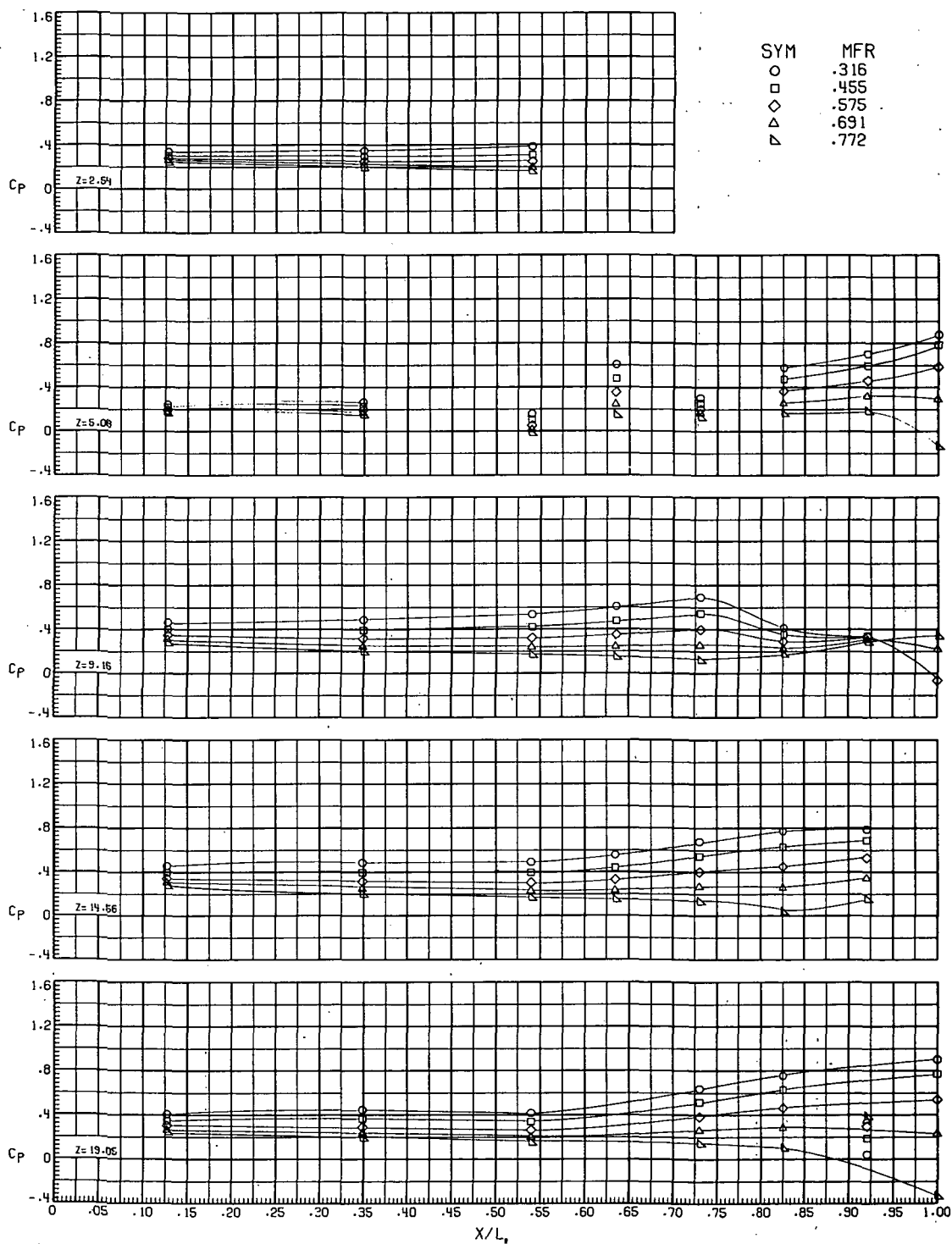
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28. - Continued.



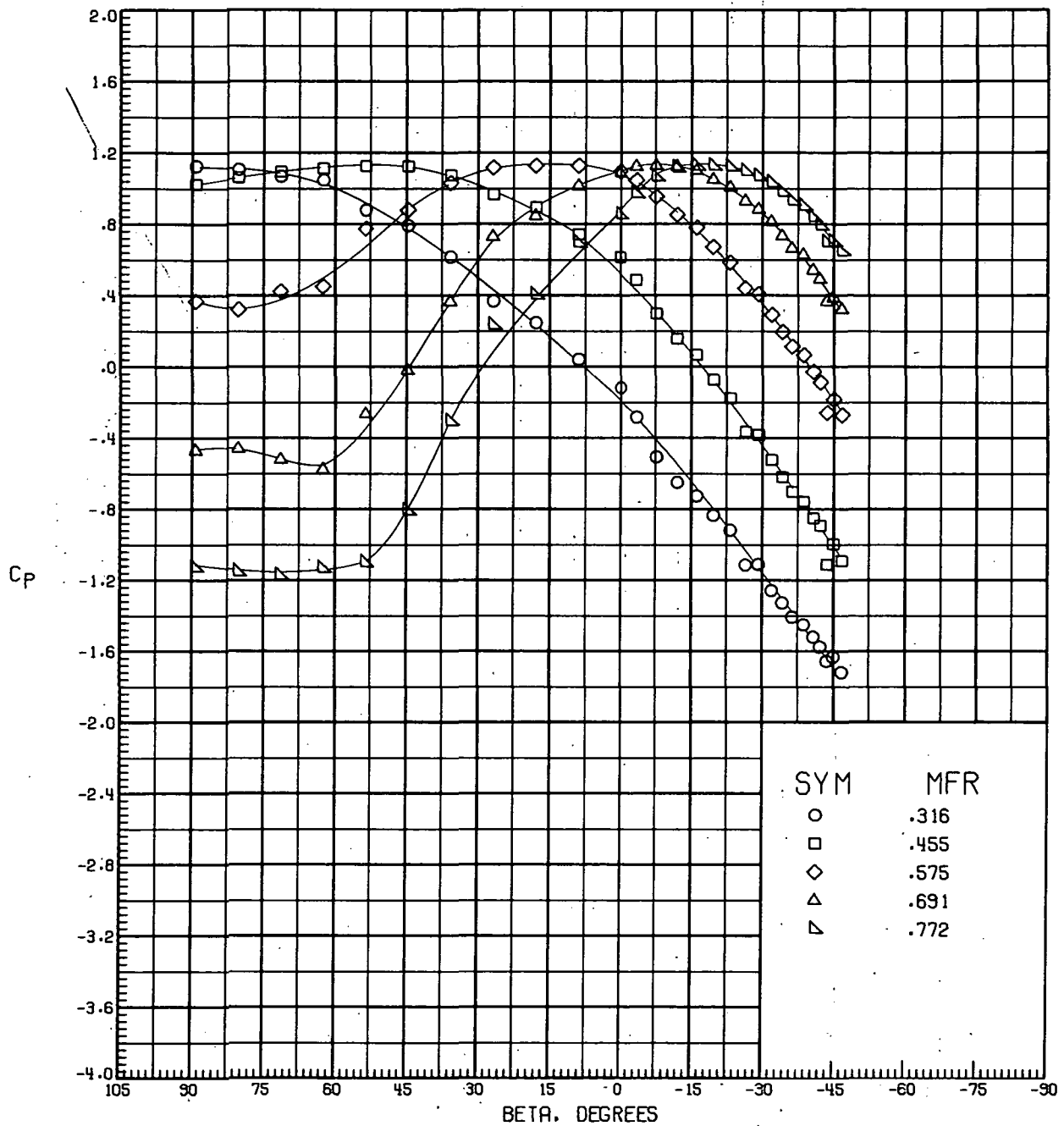
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 28. - Continued.



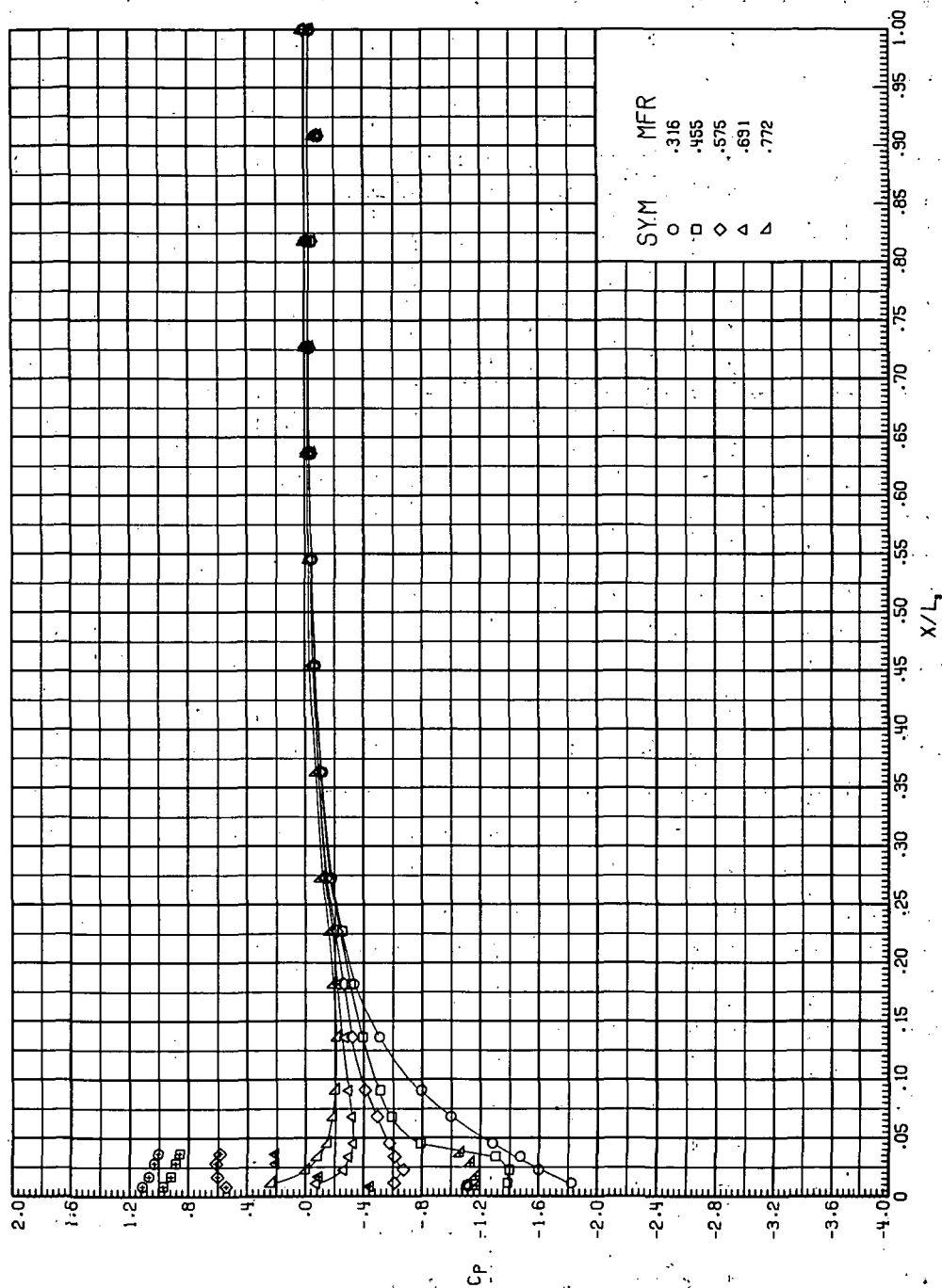
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



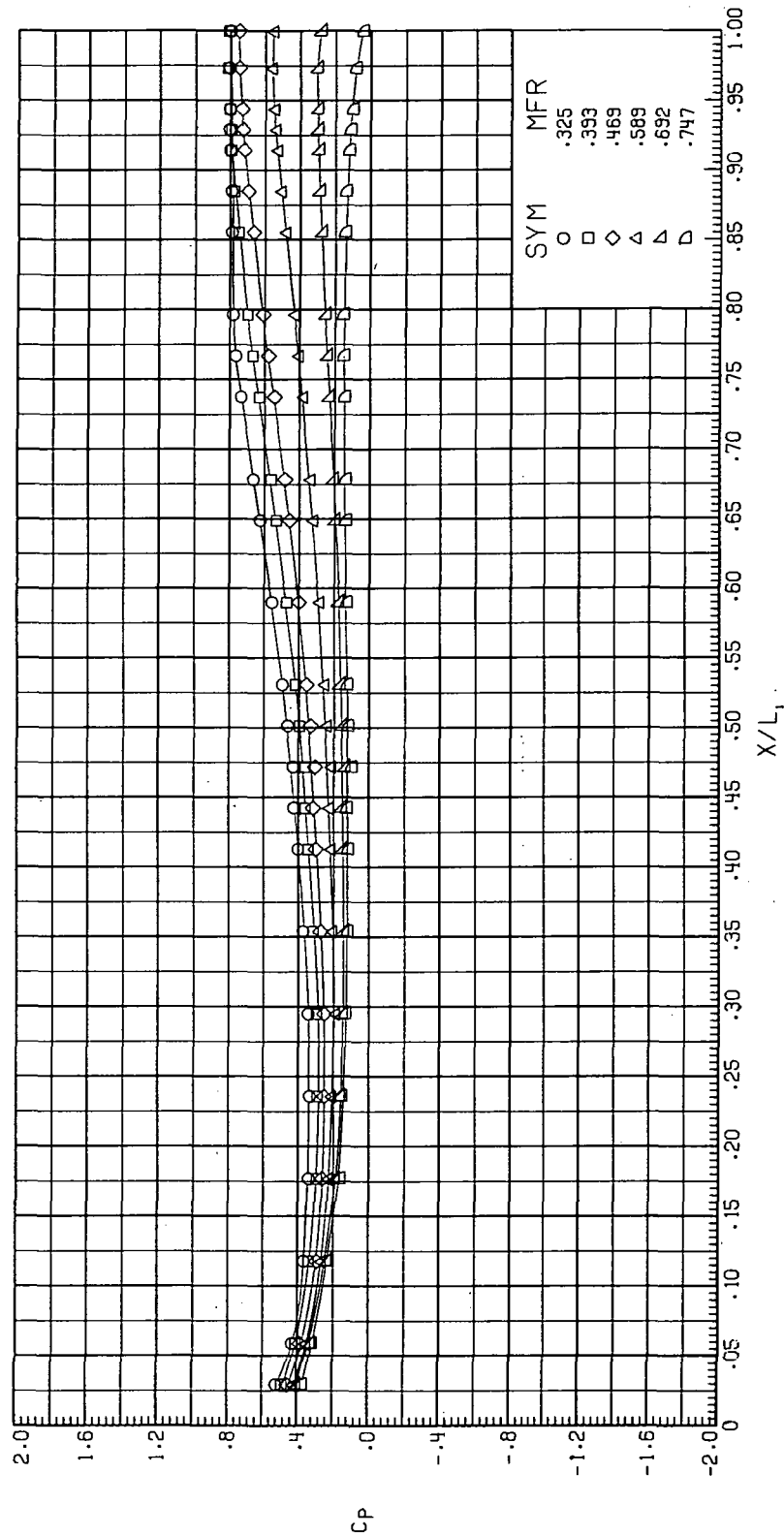
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



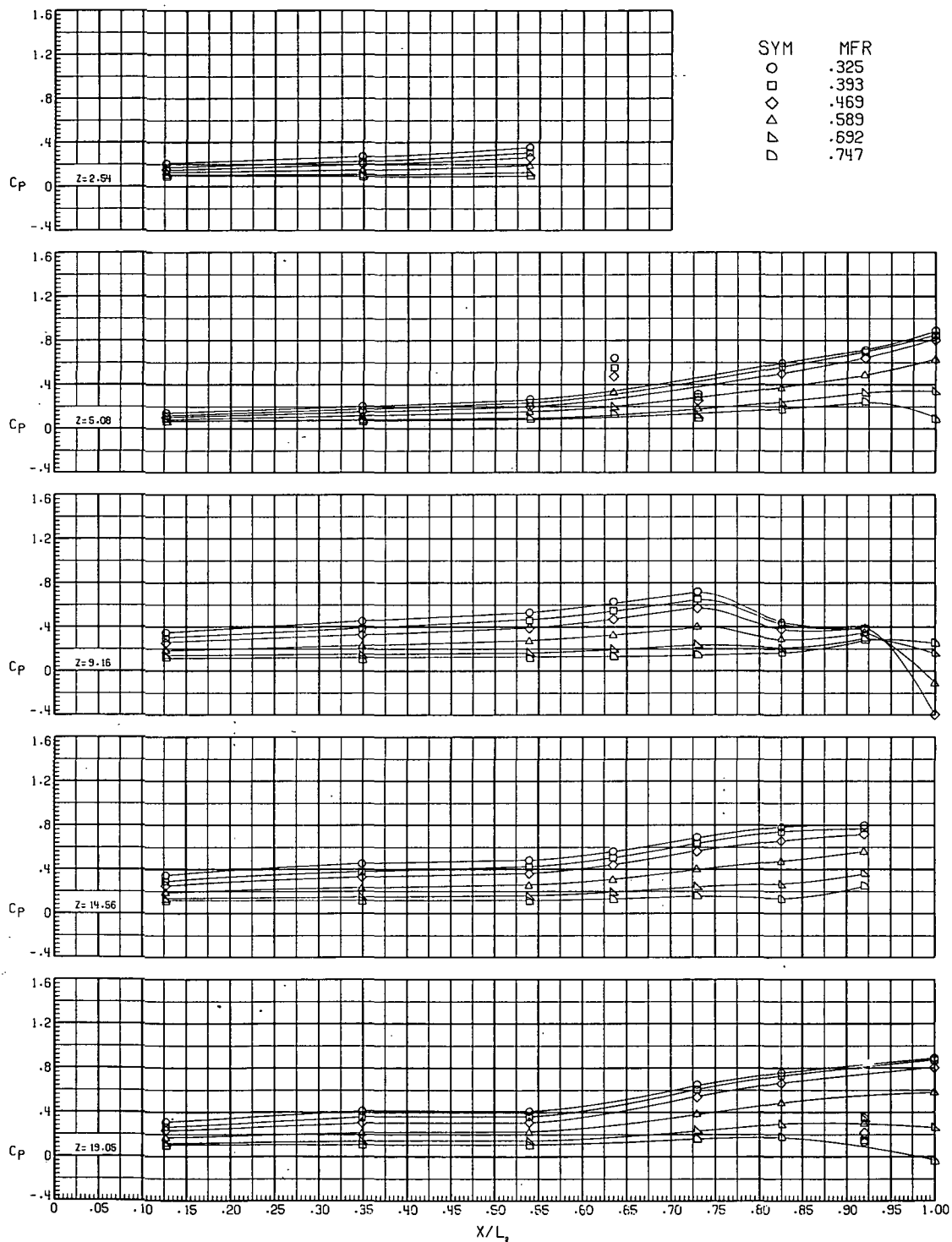
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28.- Continued.



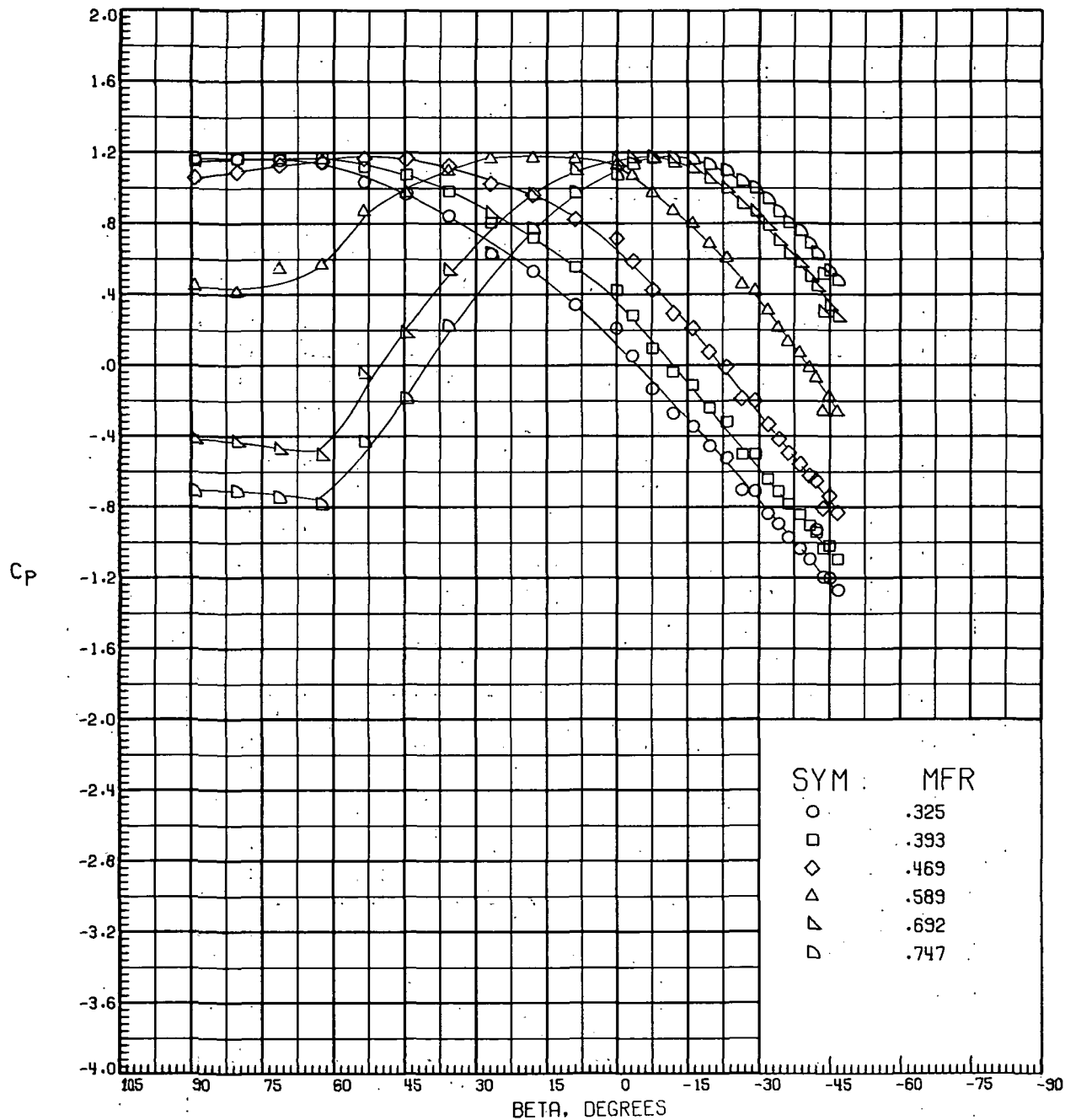
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



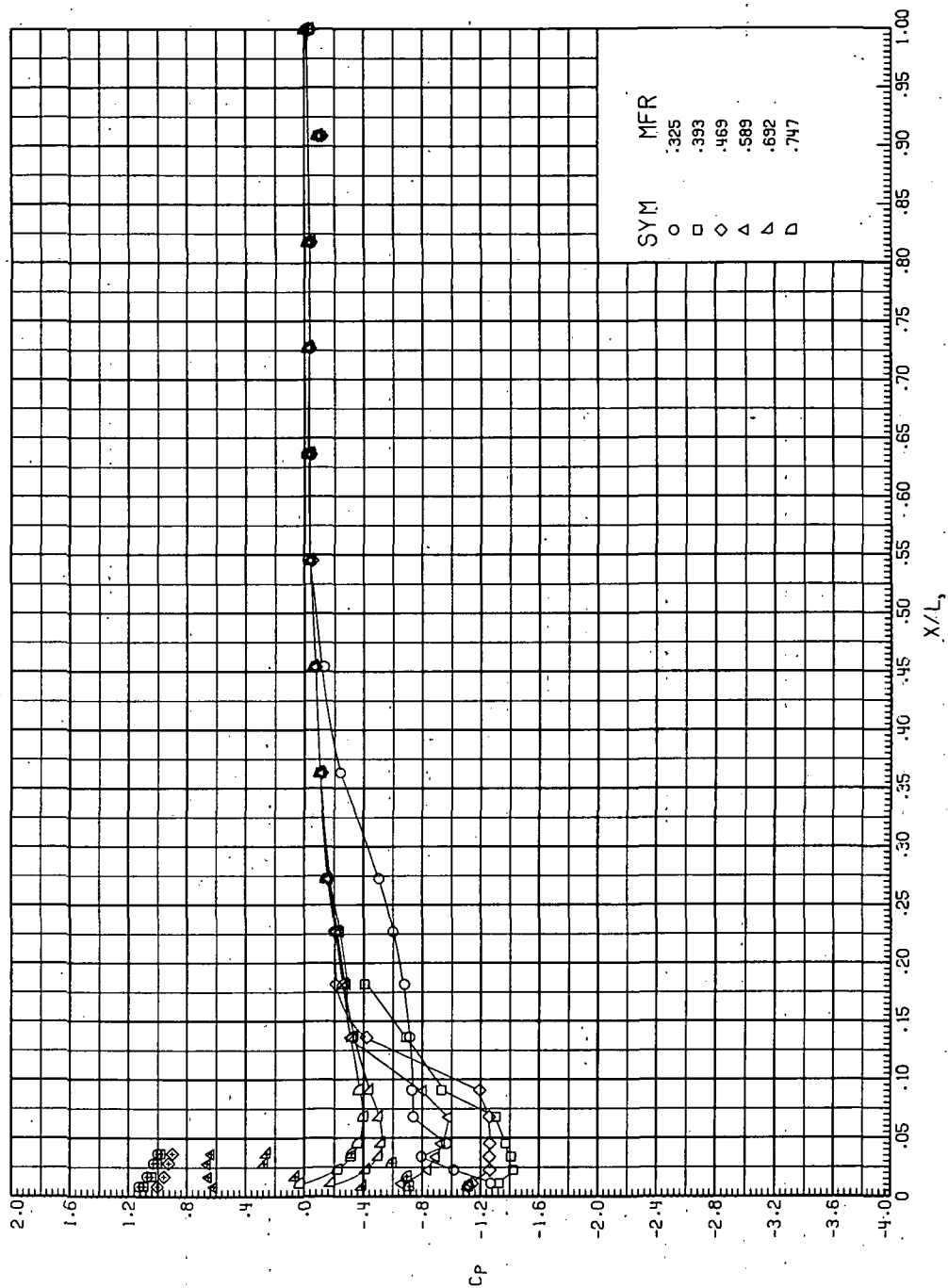
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



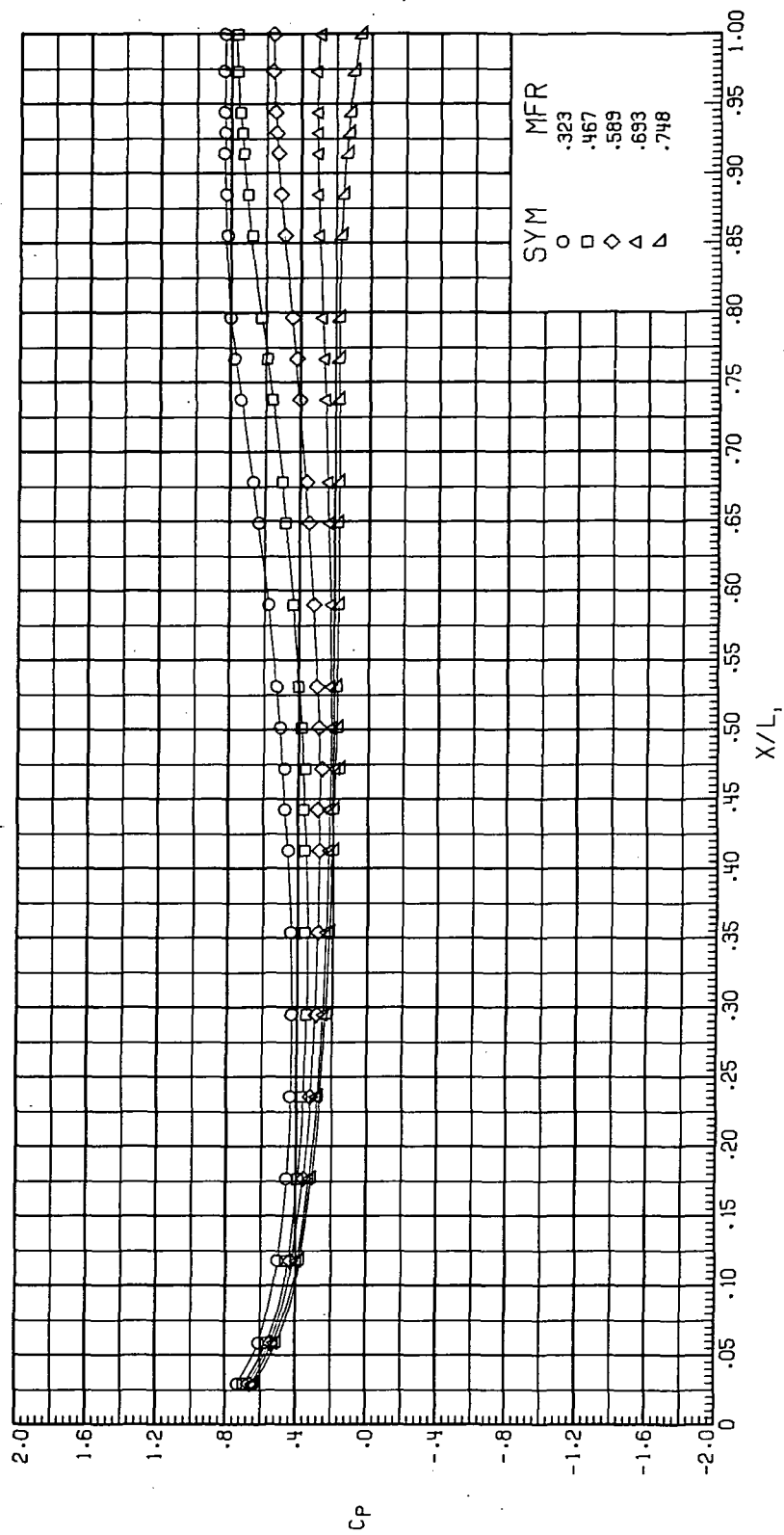
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



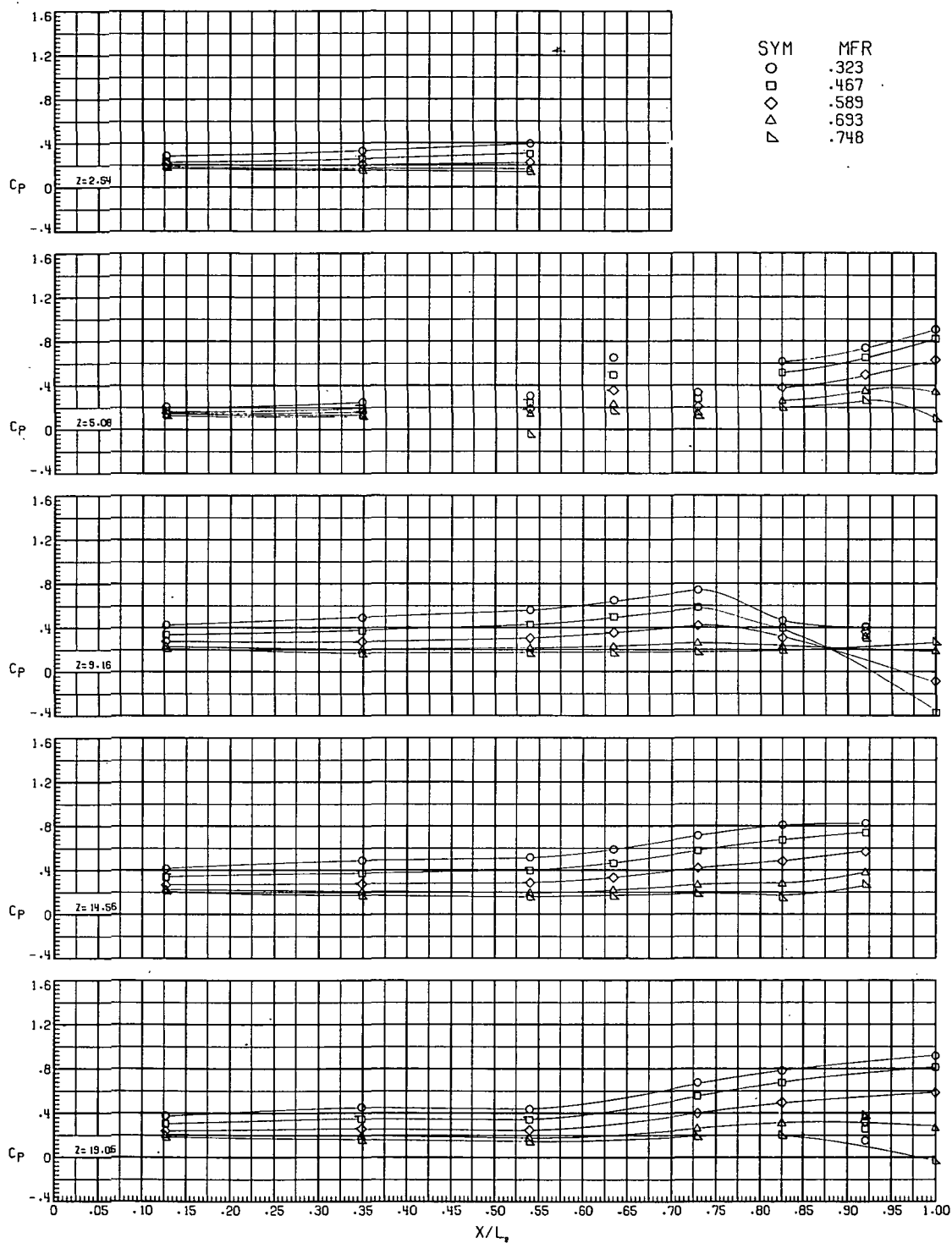
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28.- Continued.



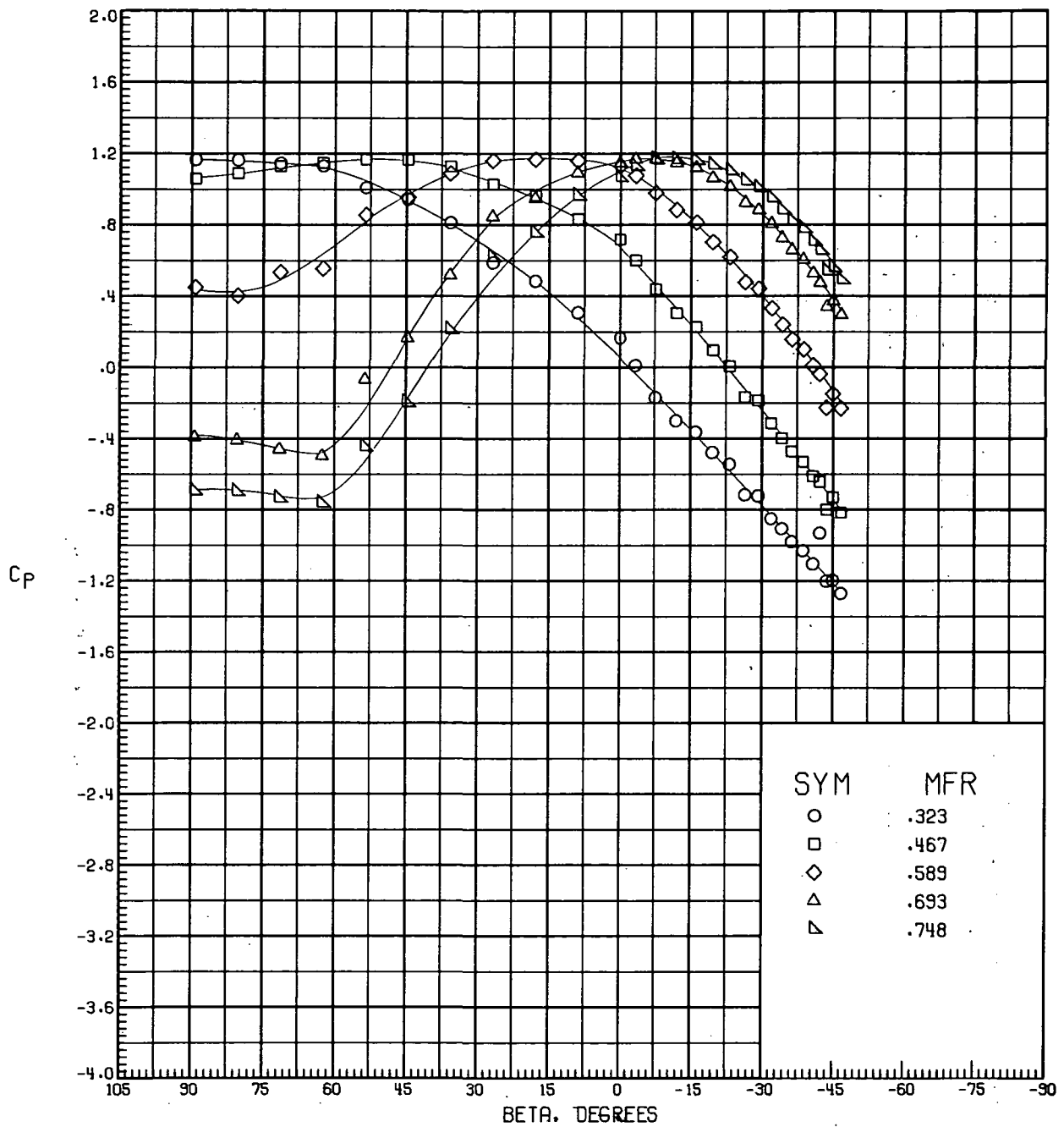
(h) $M = 0.8$; $\alpha = 40^\circ$; ramp pressure coefficients.

Figure 28. - Continued.



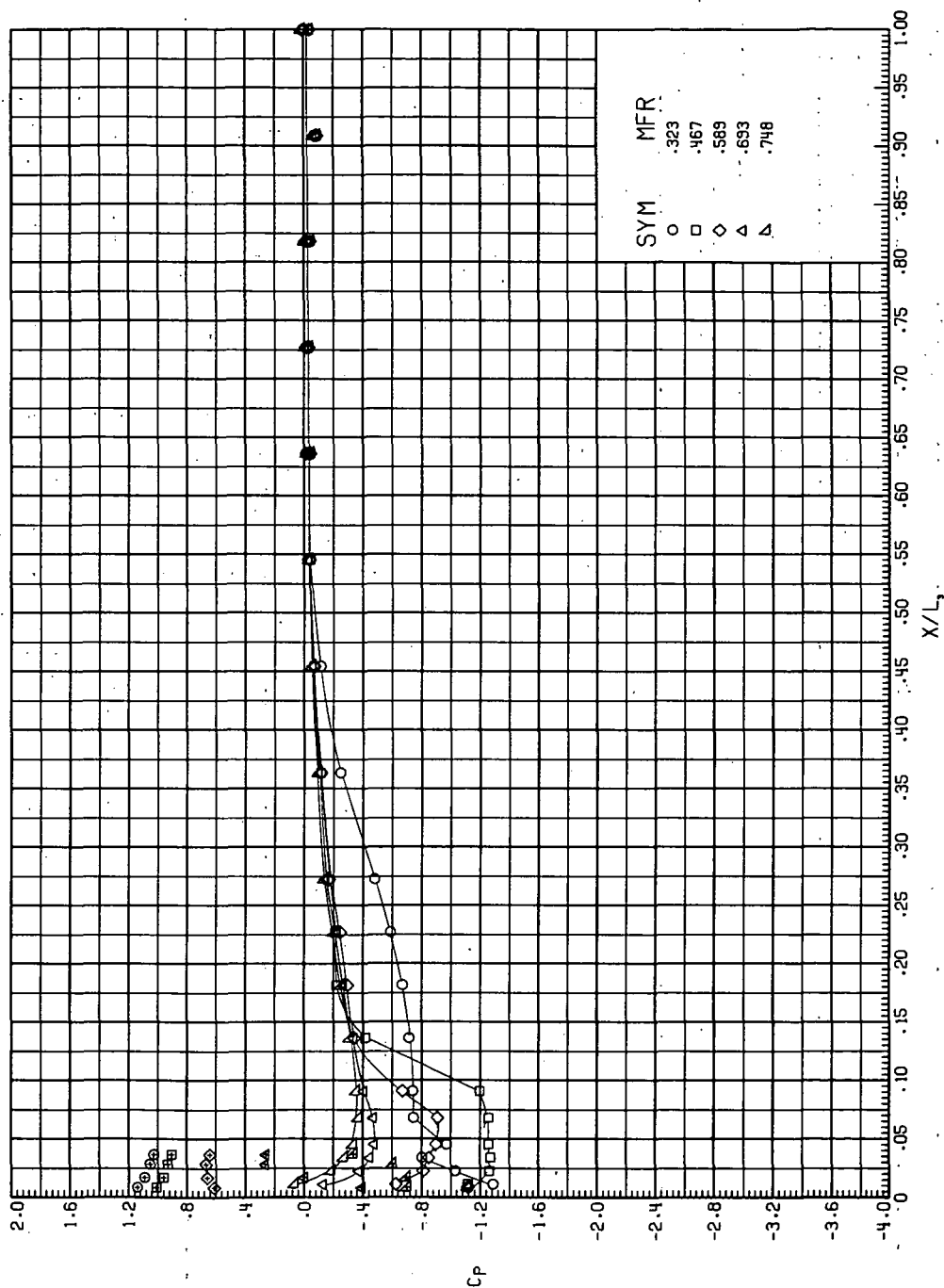
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



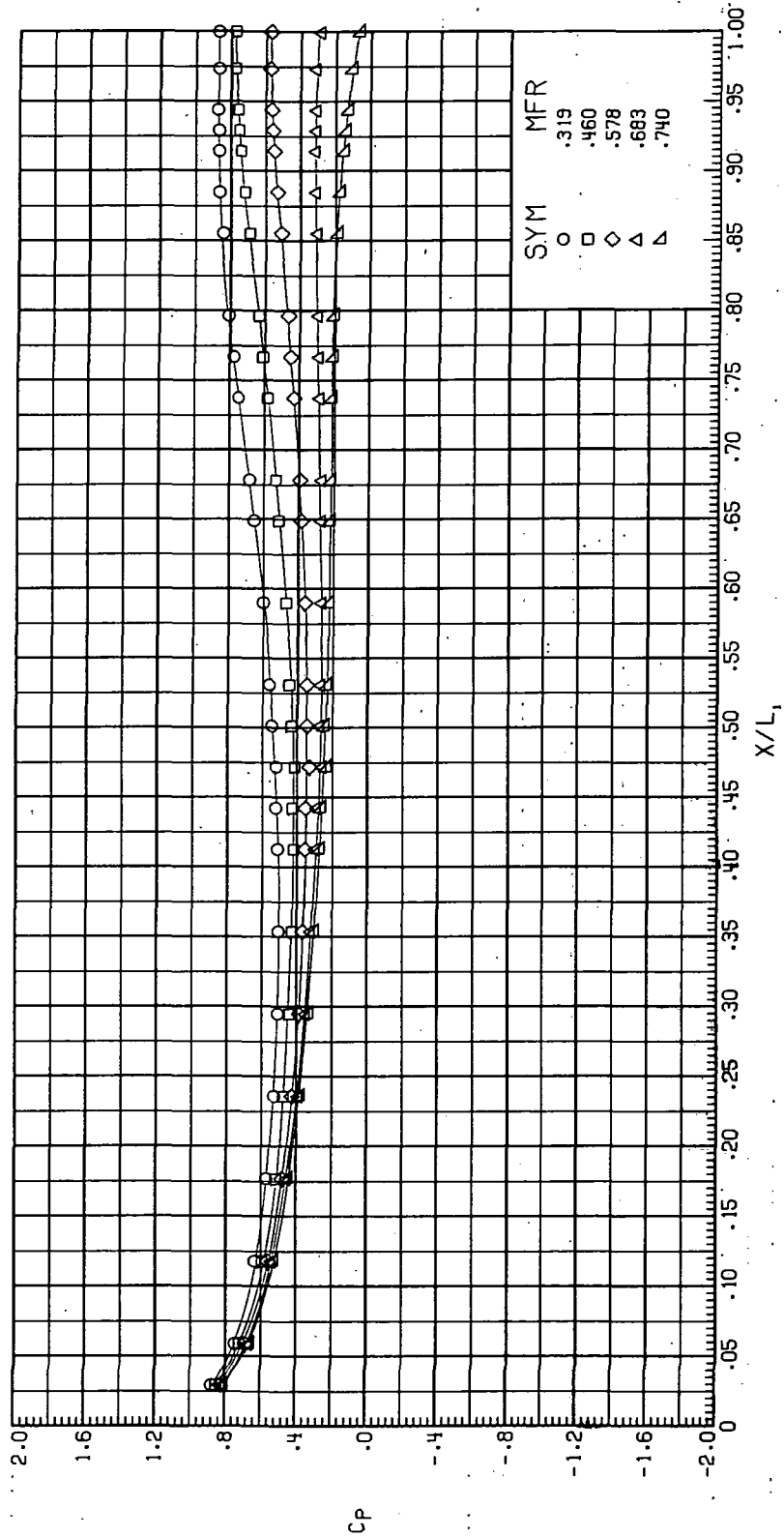
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



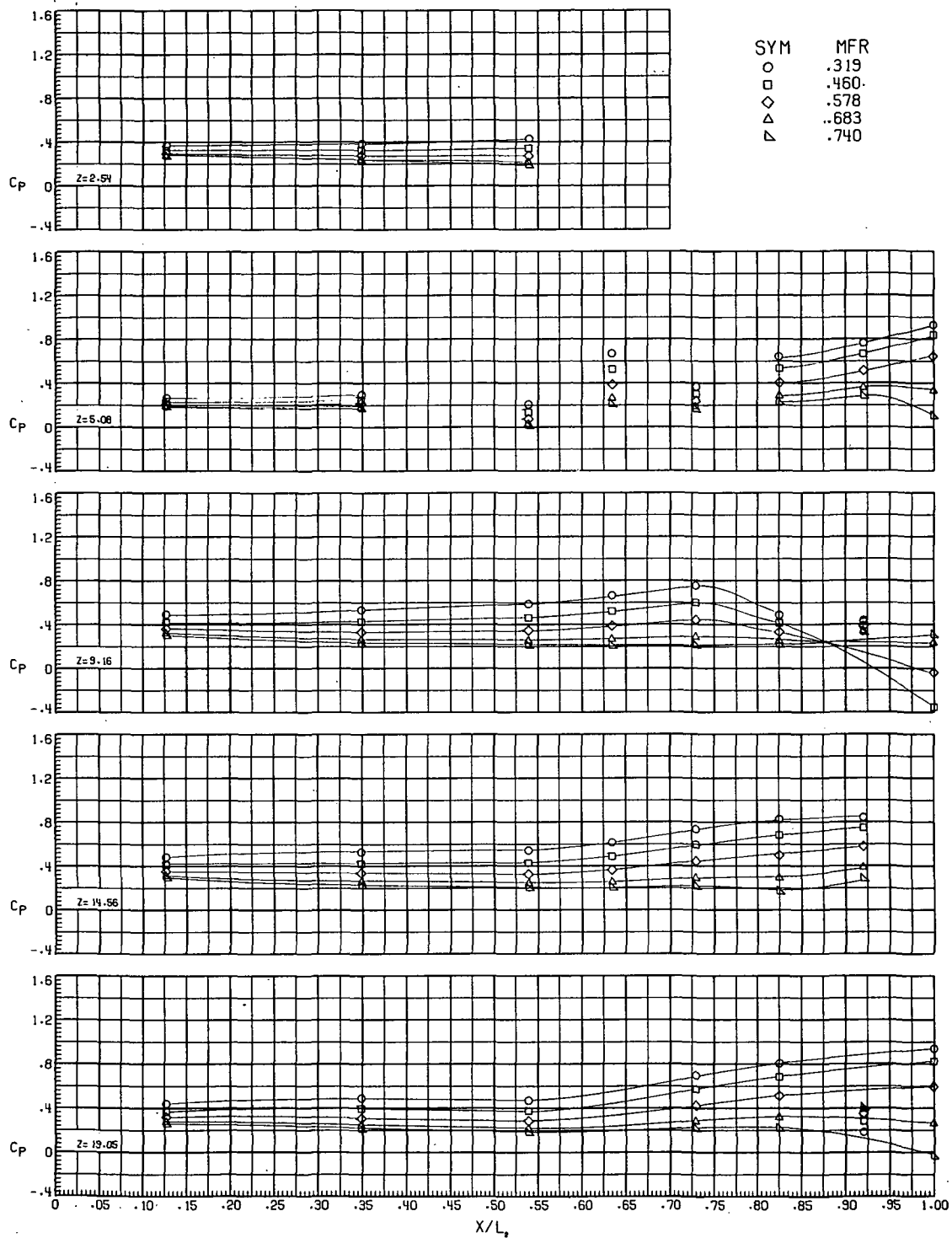
(h) $M = 0.8$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28.- Continued.



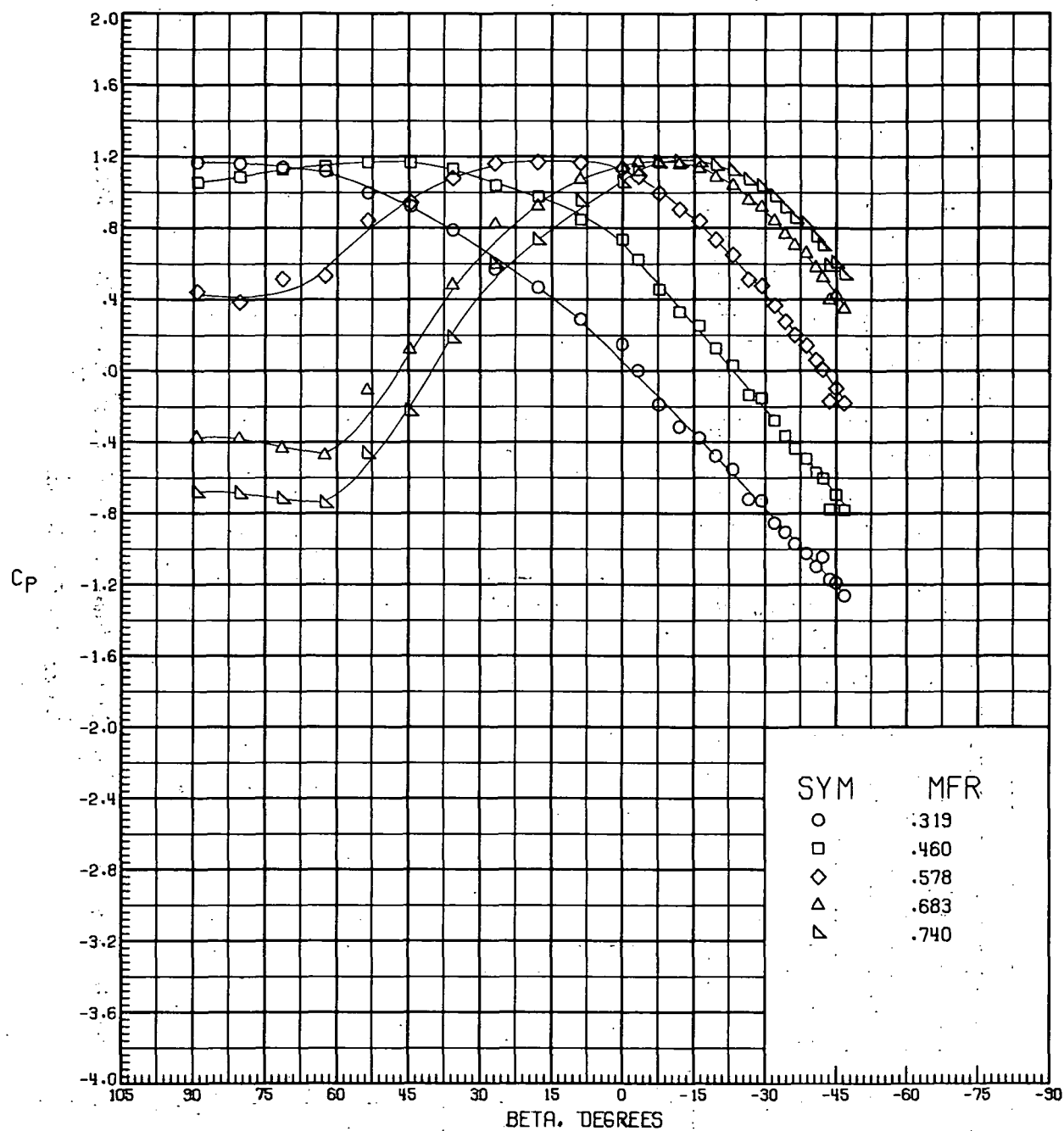
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 28.- Continued.



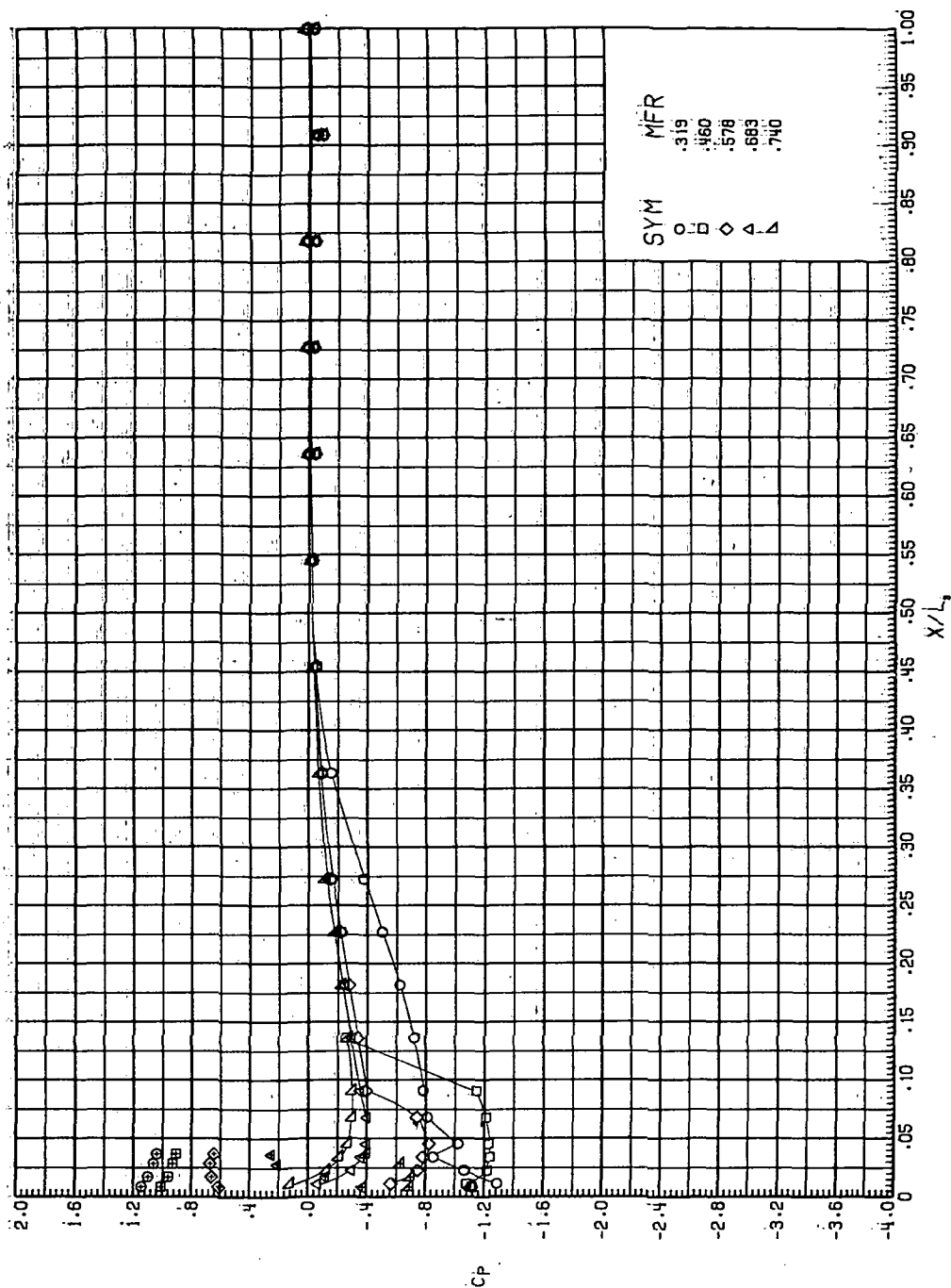
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 28.- Continued.



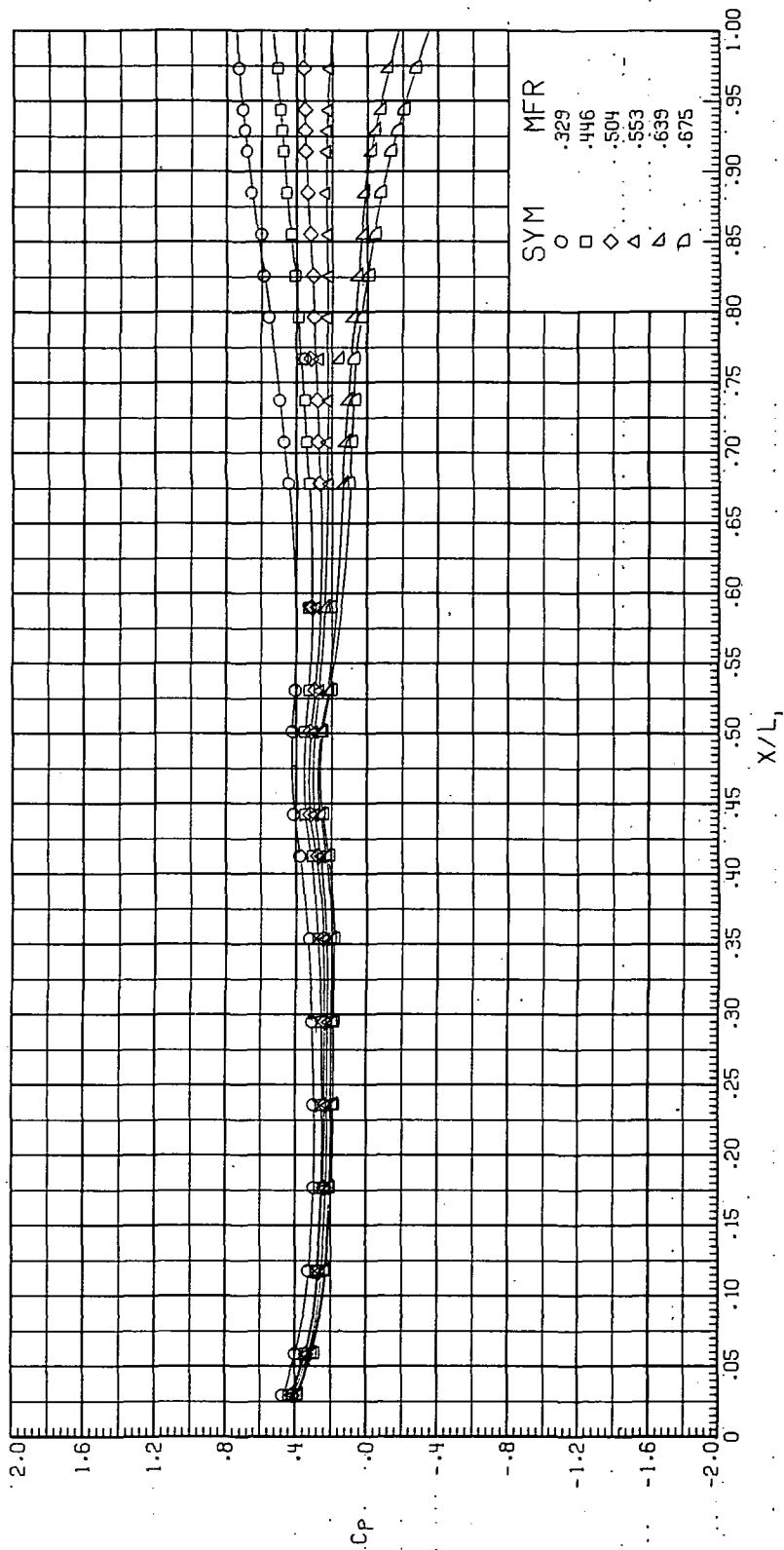
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 28.- Continued.



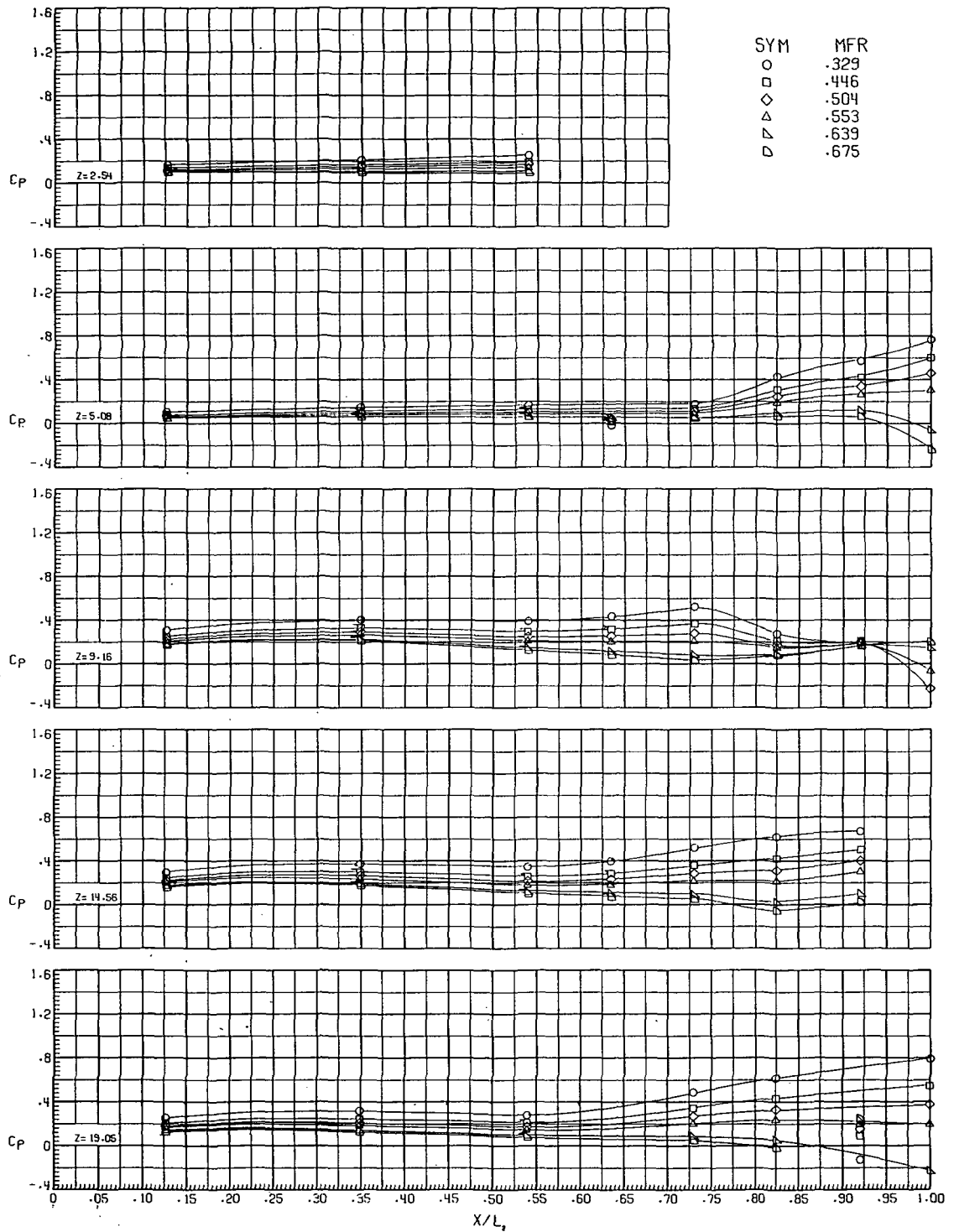
(1) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 28. - Concluded.



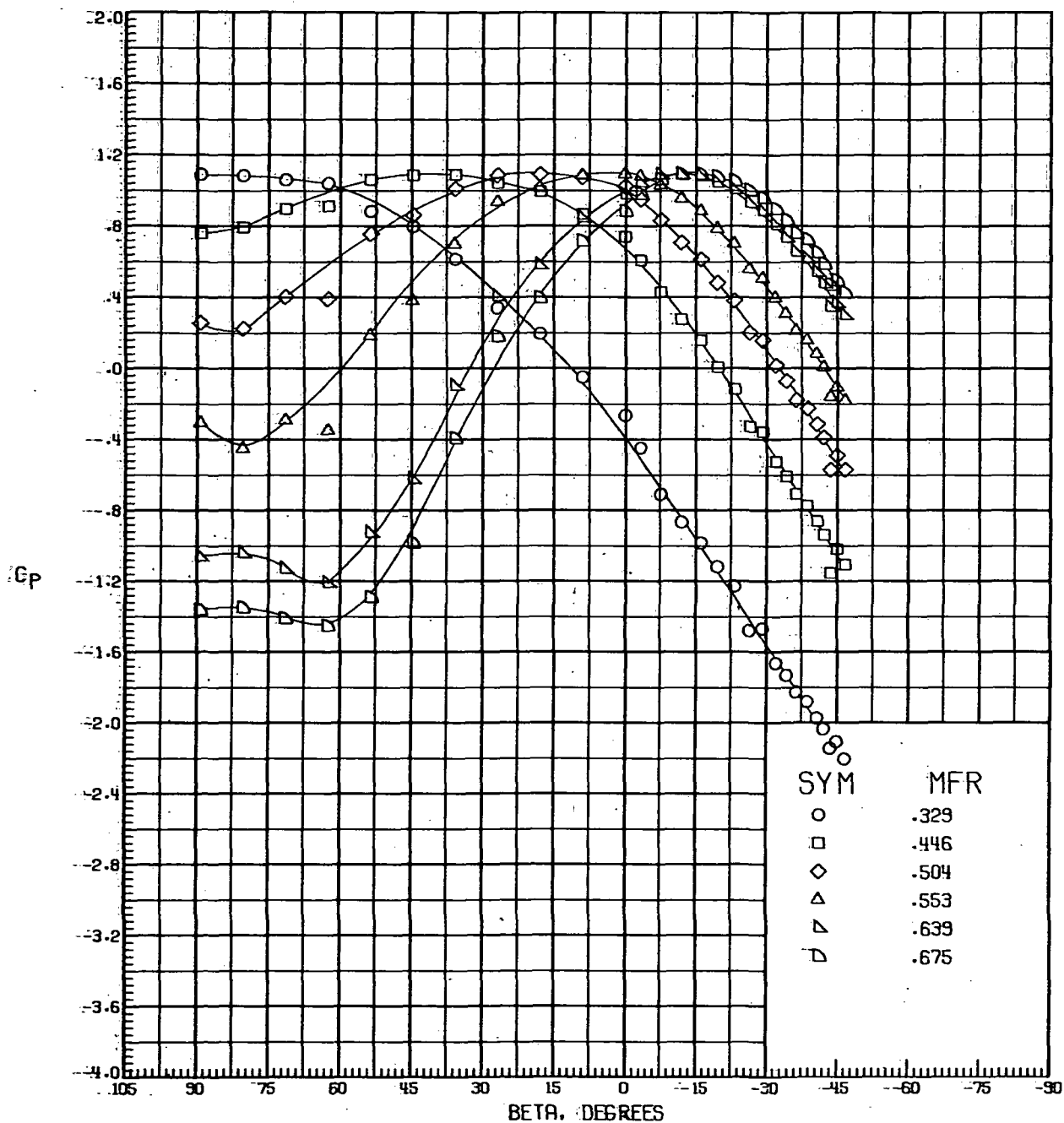
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 29.- Pressure coefficients for cowl 90-2. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



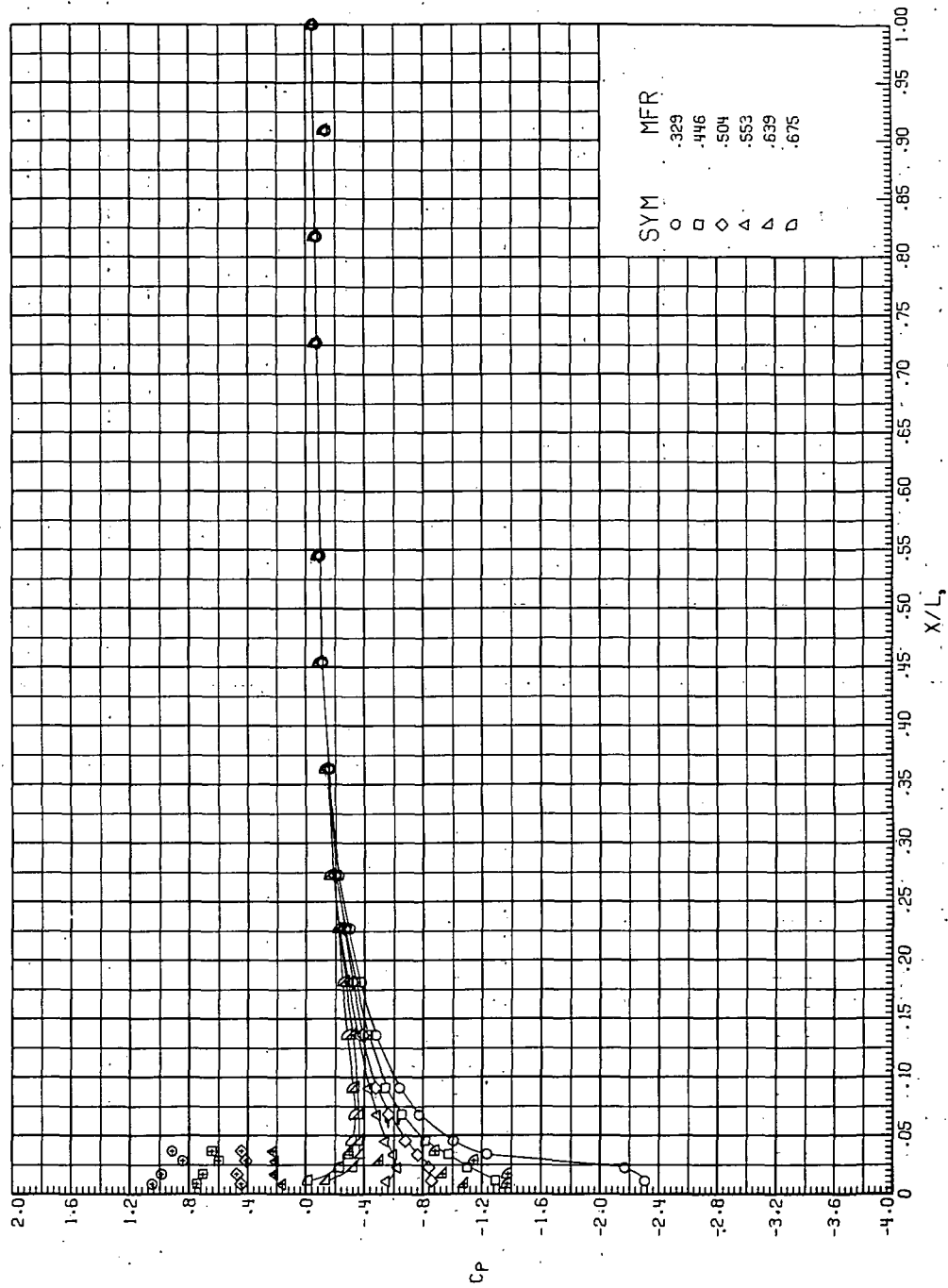
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



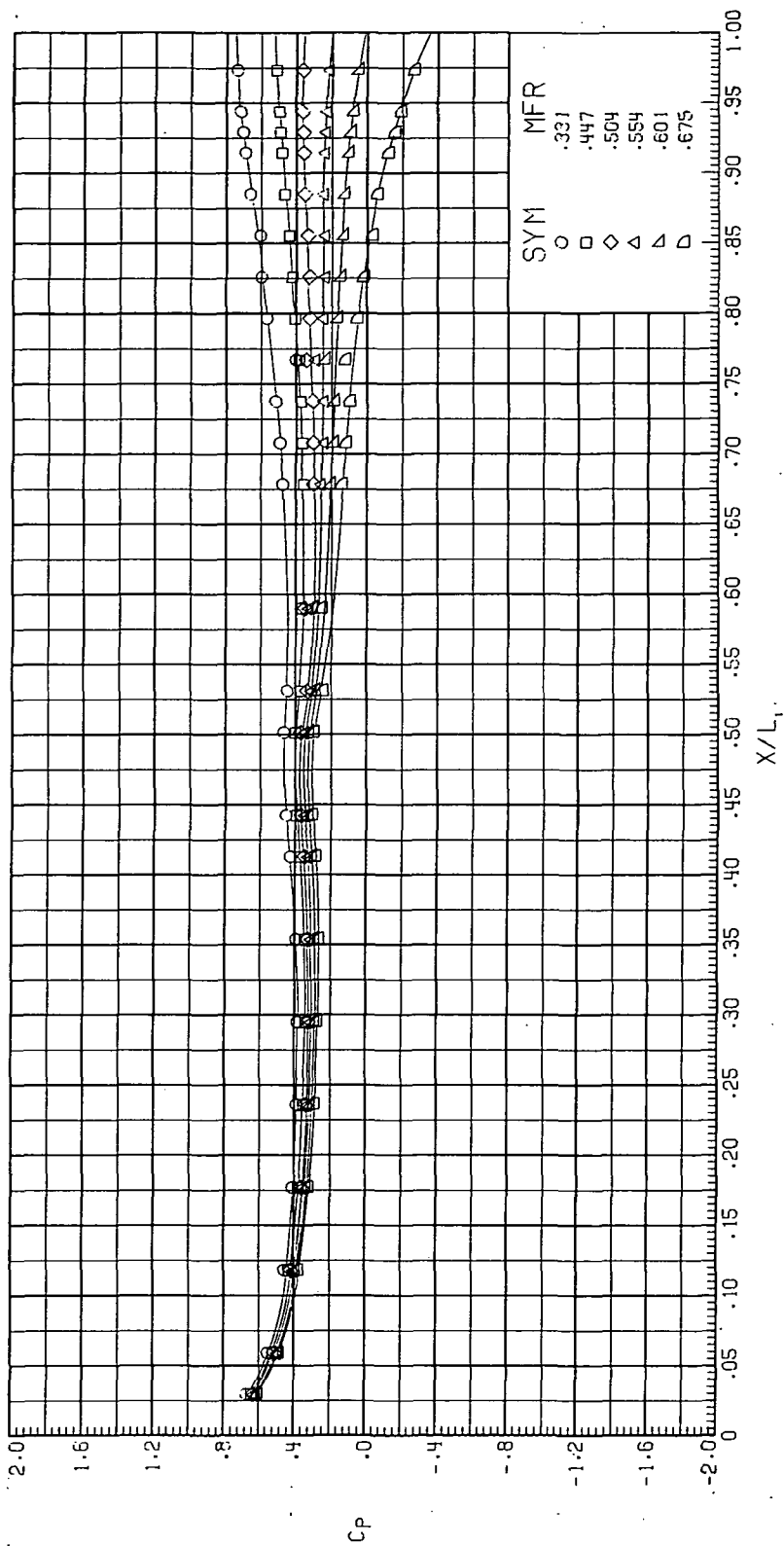
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



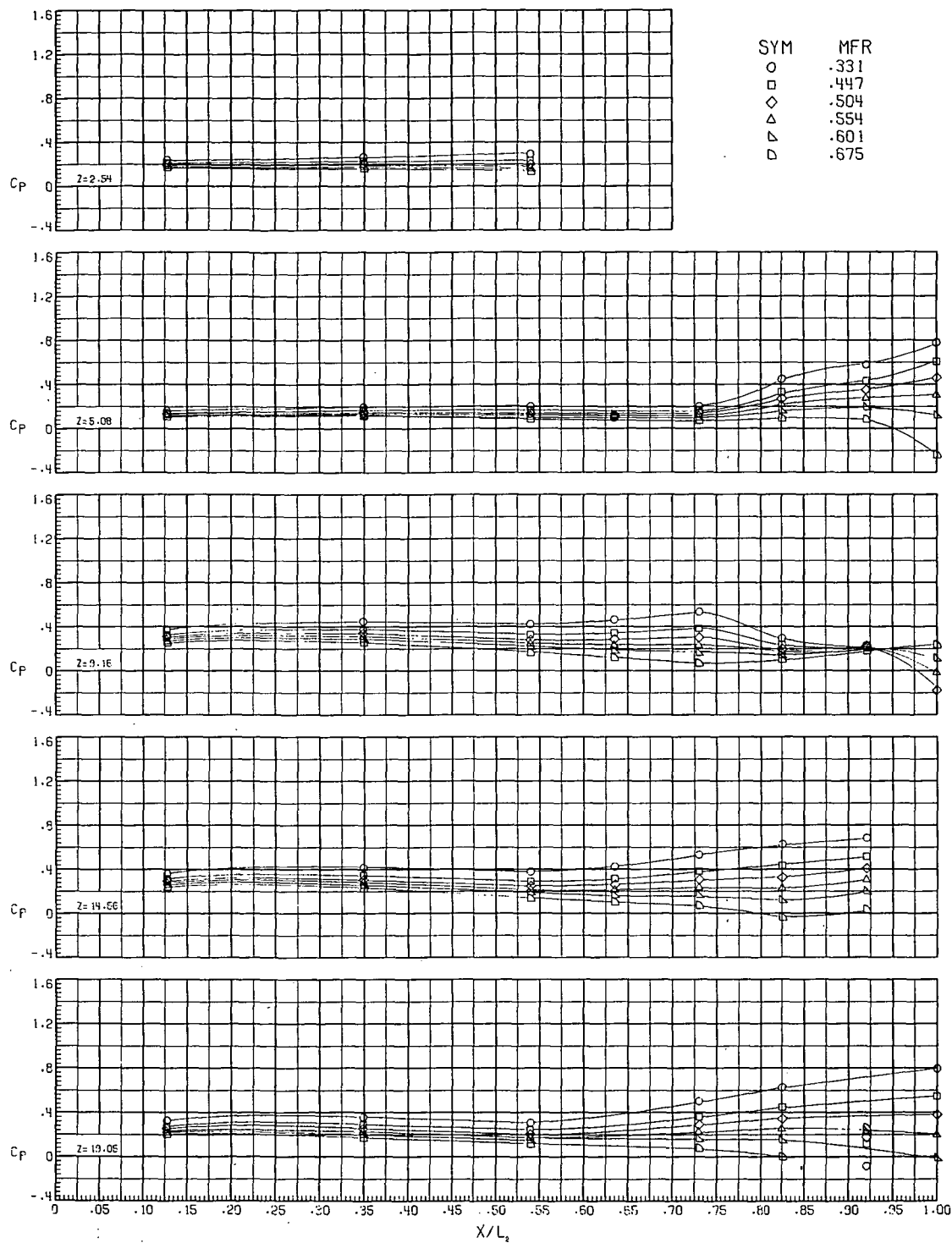
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Continued.



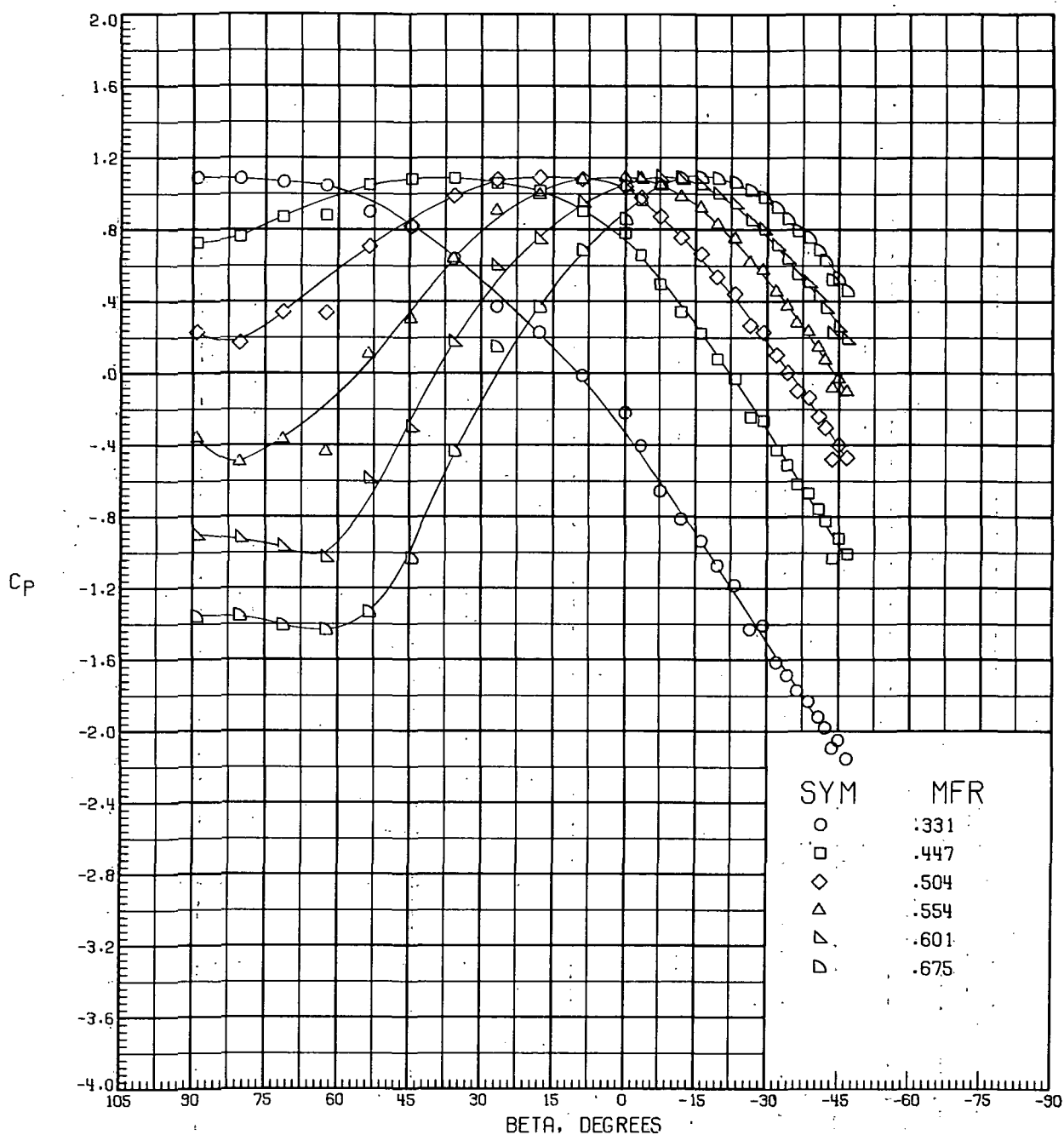
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 29.- Continued.



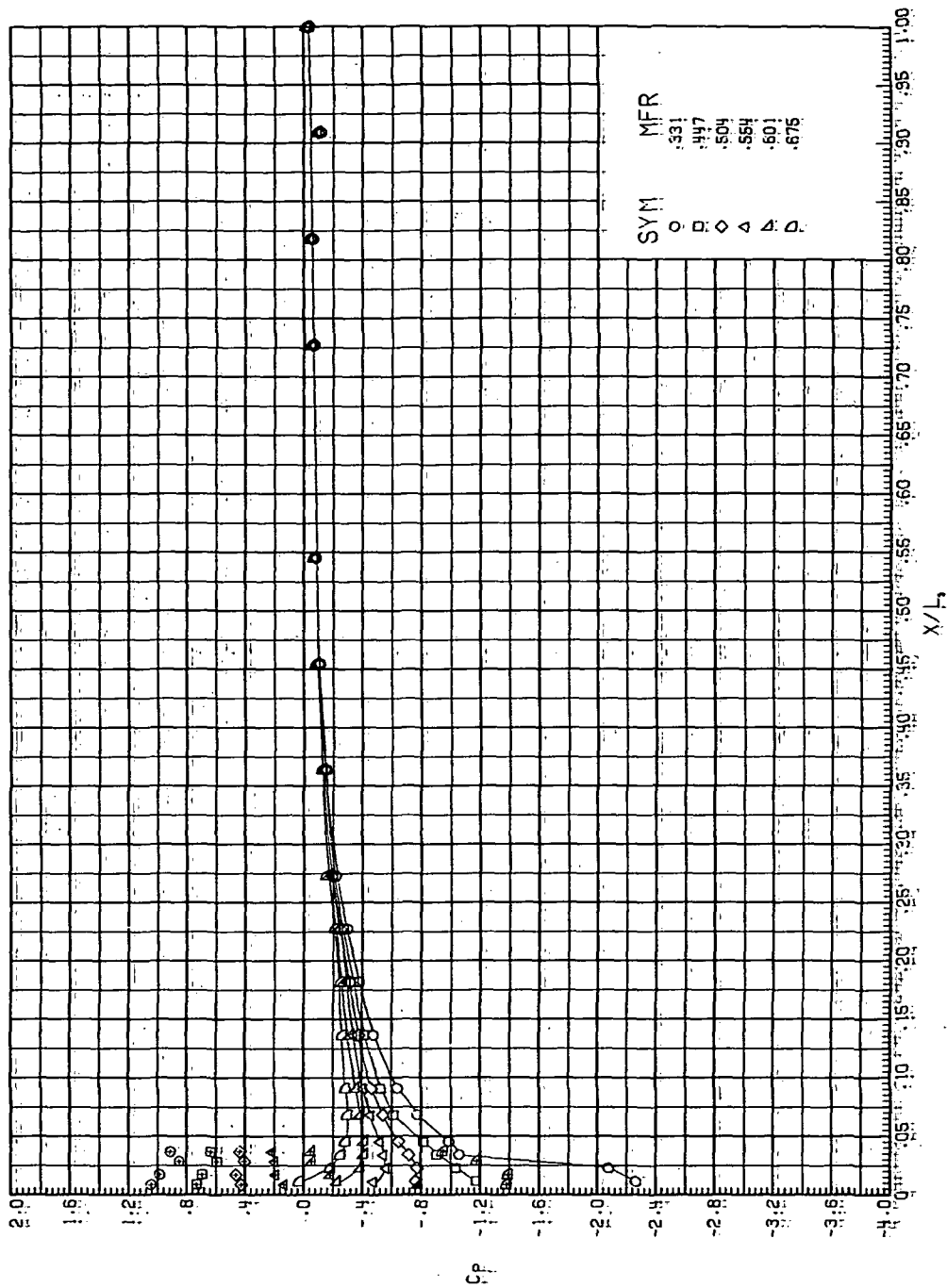
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



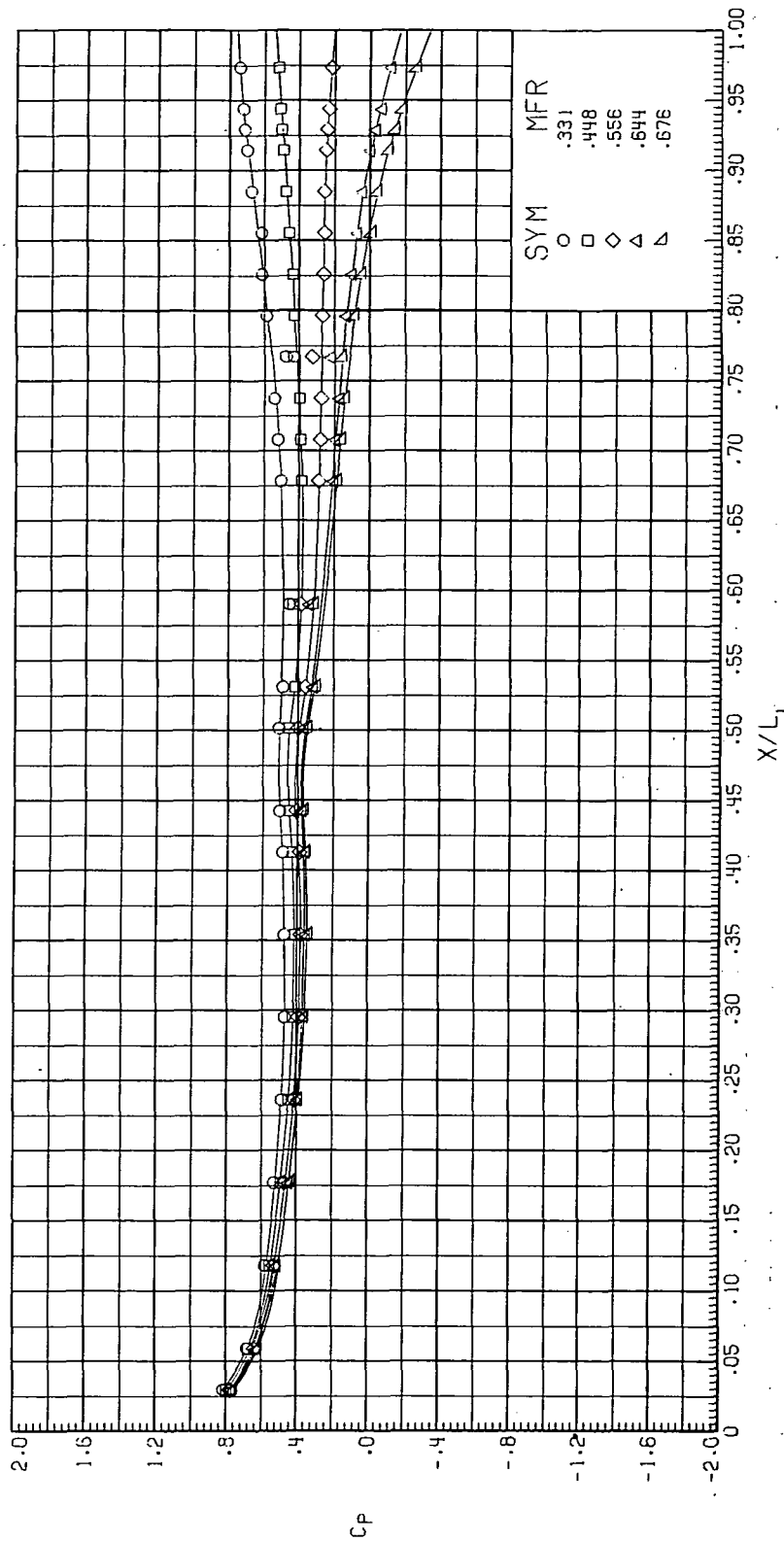
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



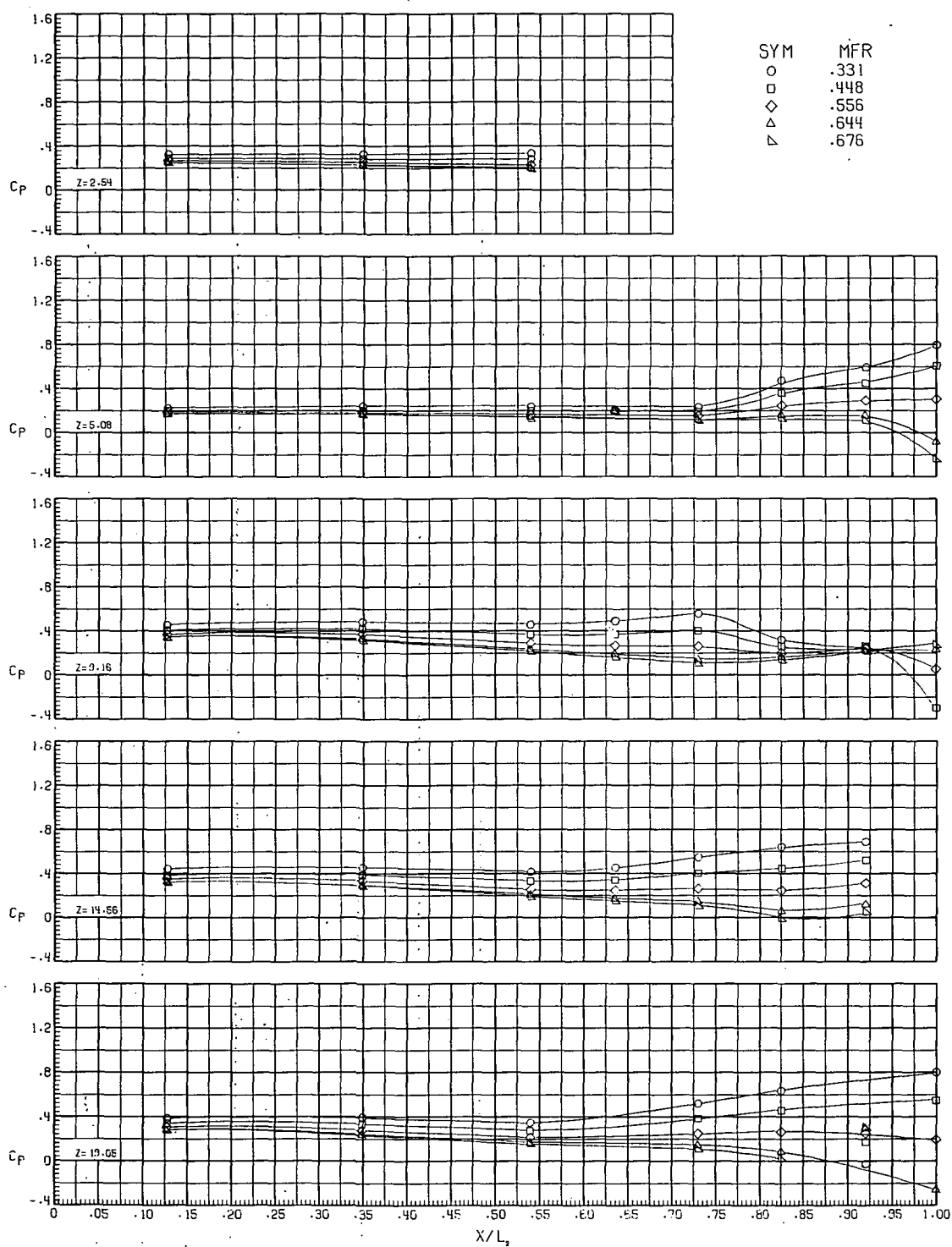
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded

Figure 29.- Continued.



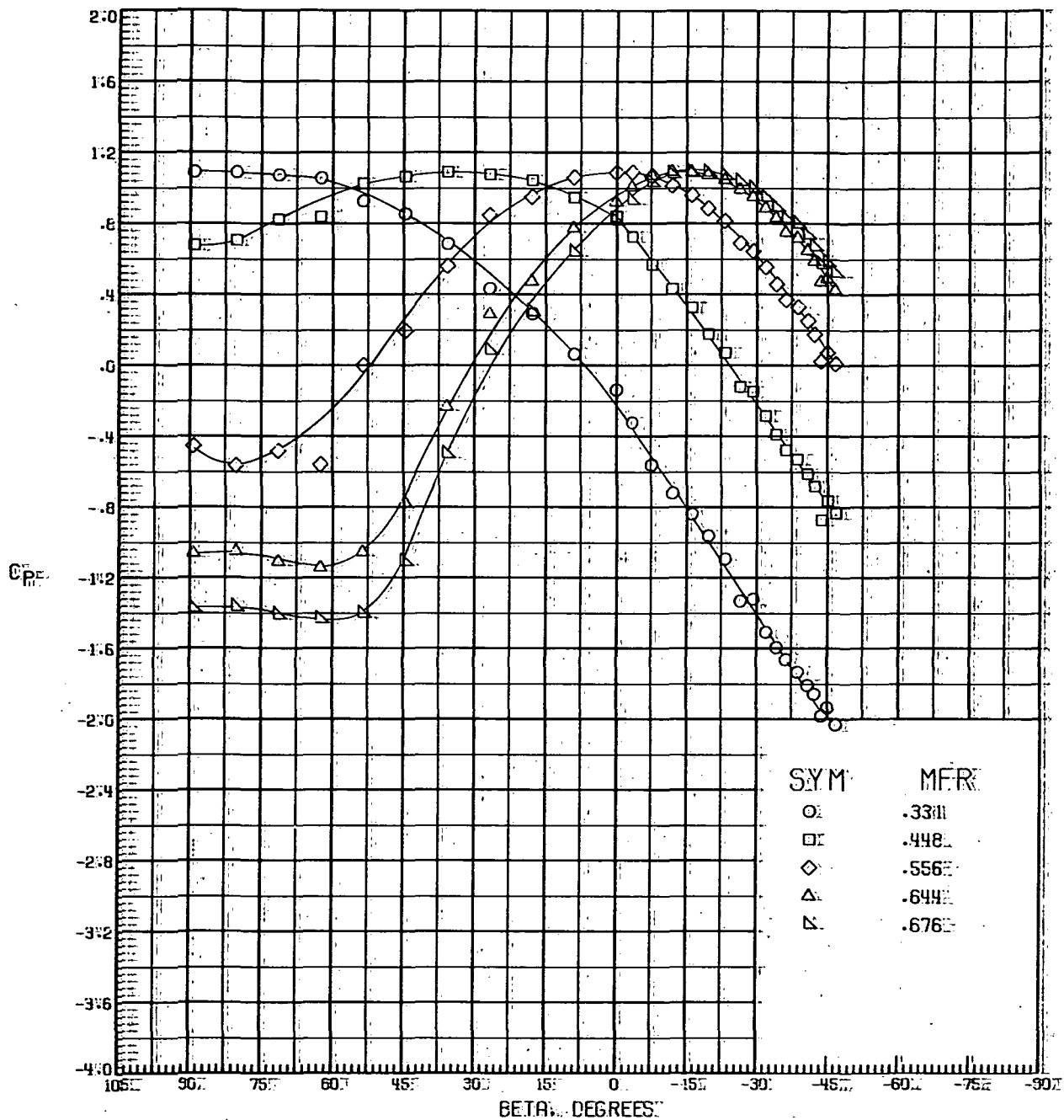
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



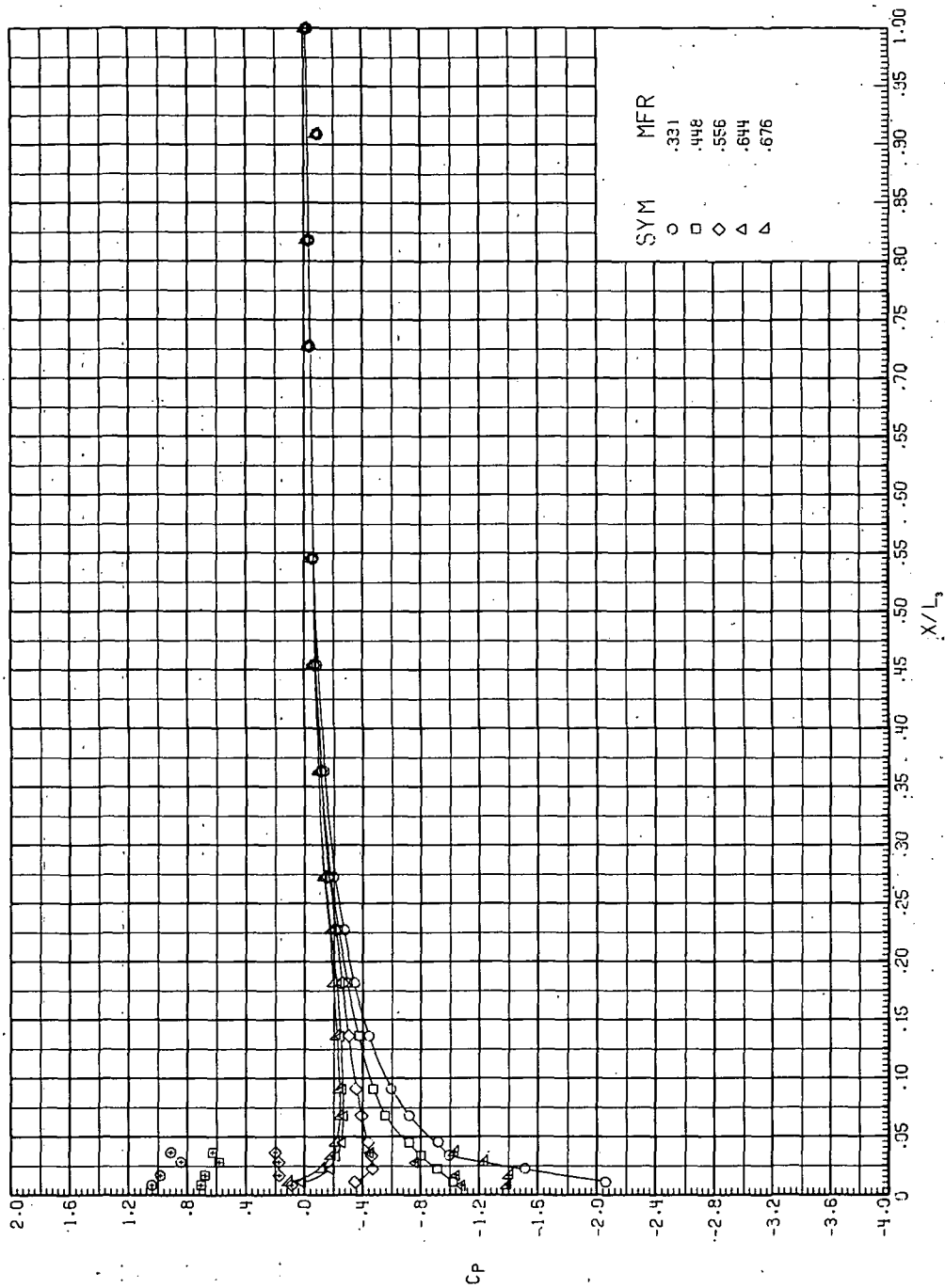
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 29. - Continued.



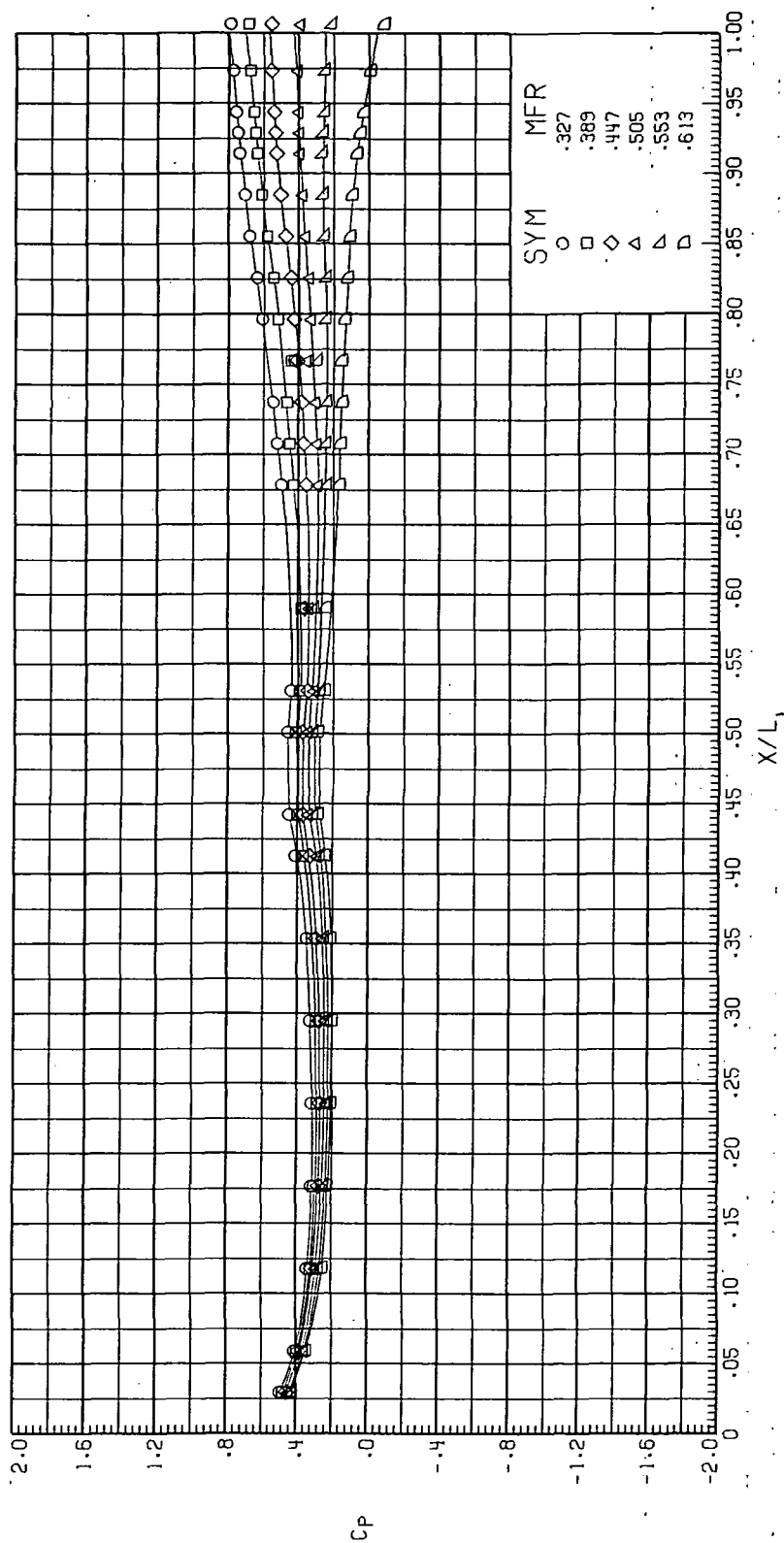
(c) $M=0.6$; $\alpha=8^\circ$; cow lip pressure coefficients. Continued.

Figure 29.--Continued.



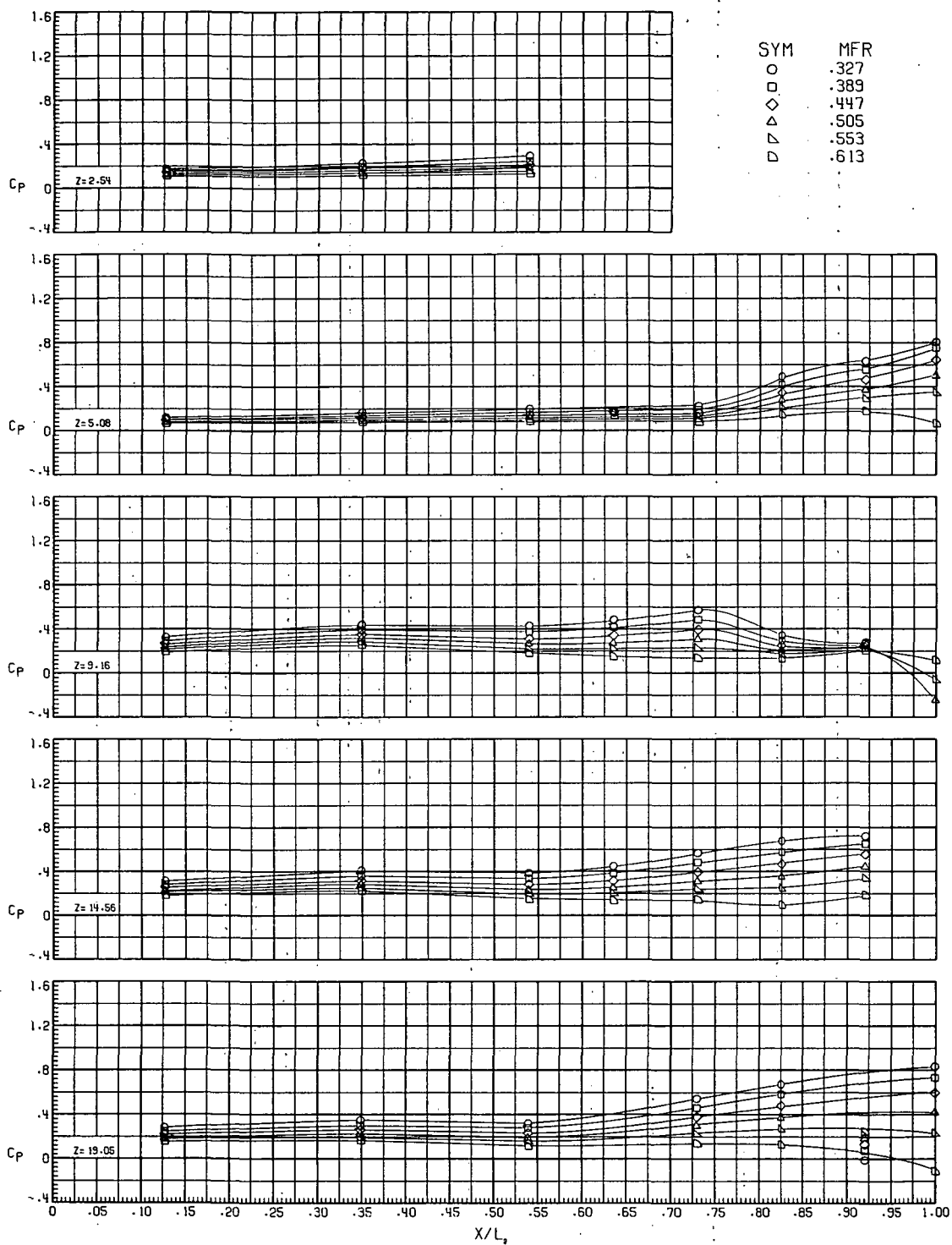
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Continued.



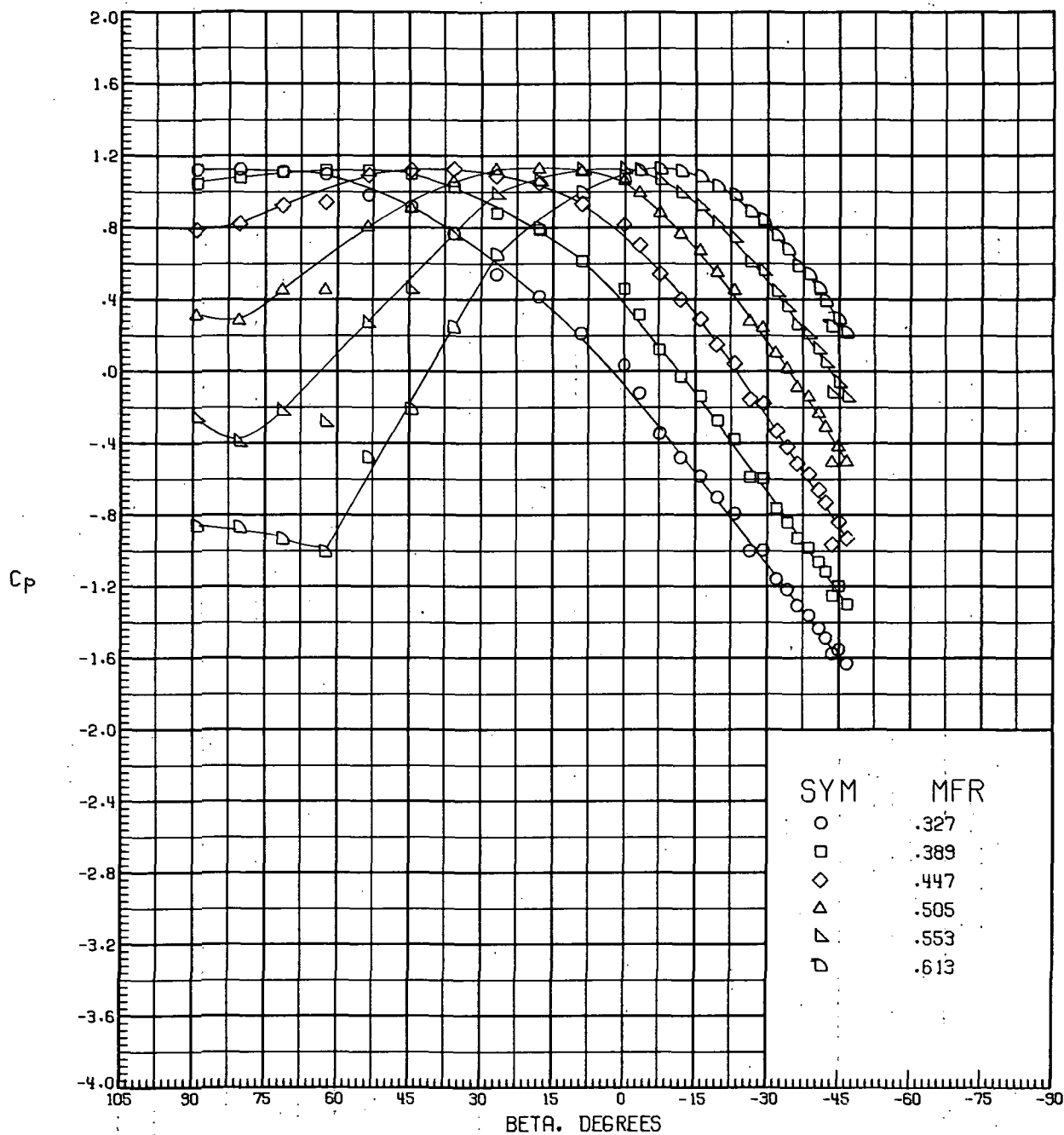
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



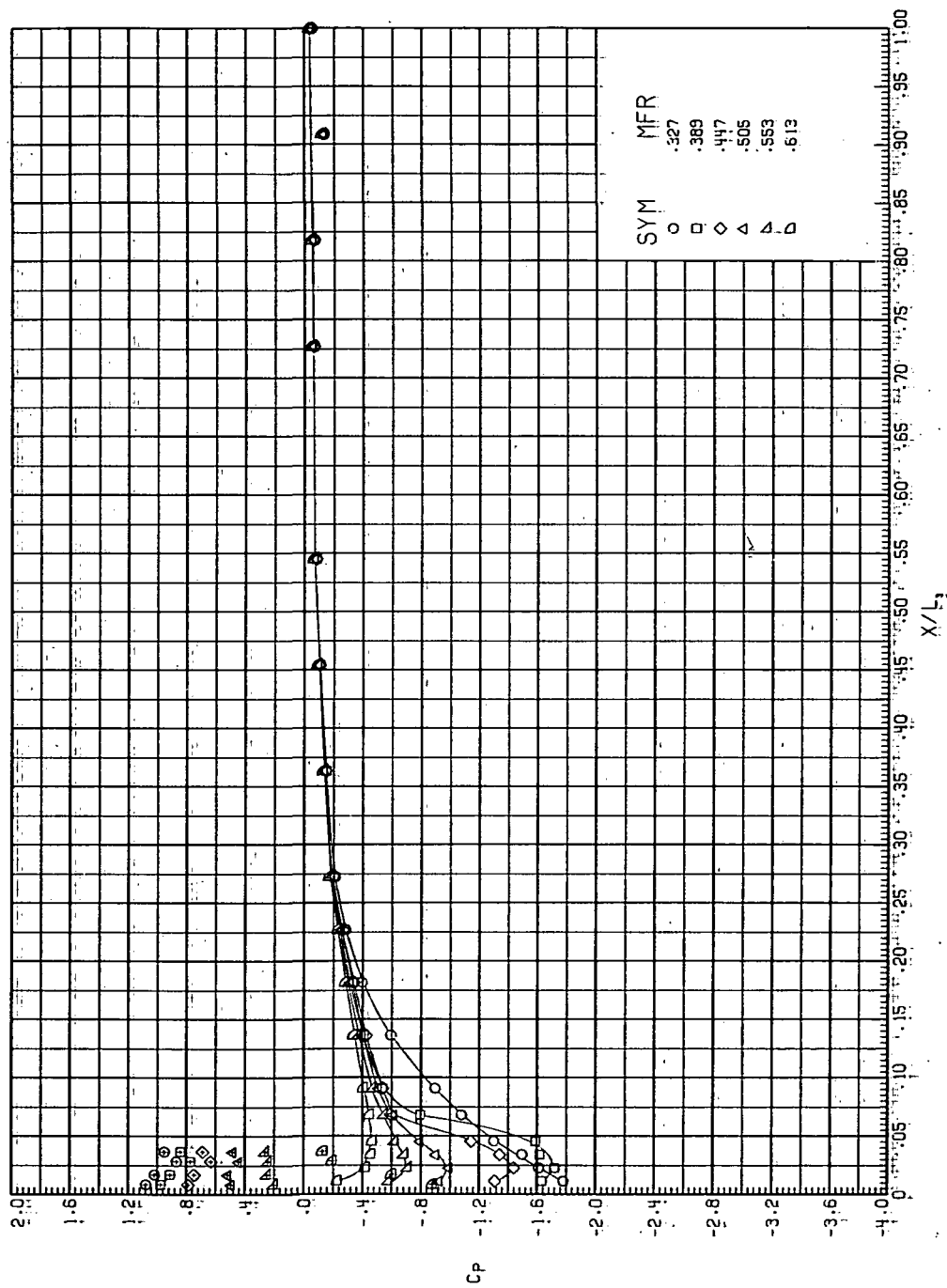
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



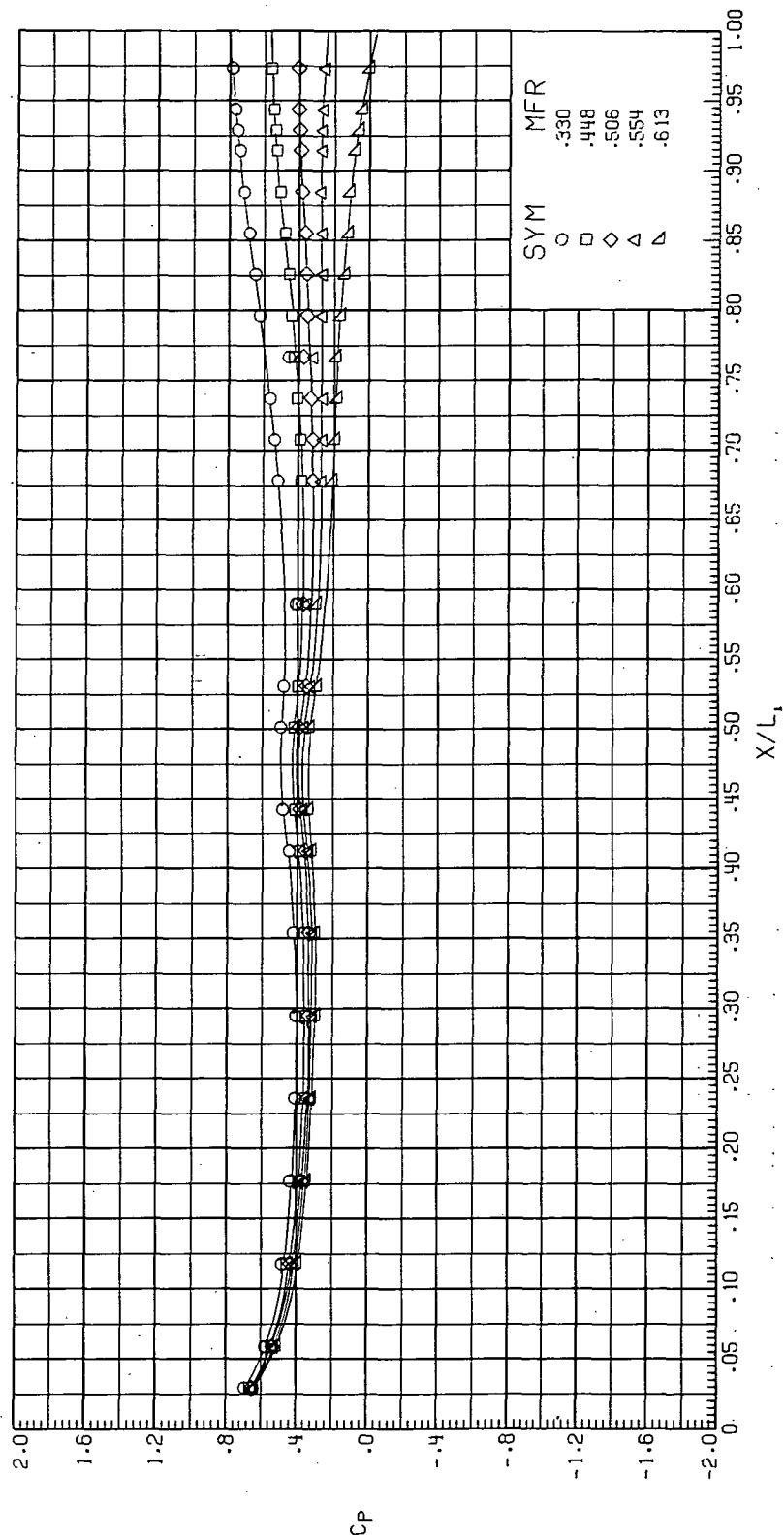
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



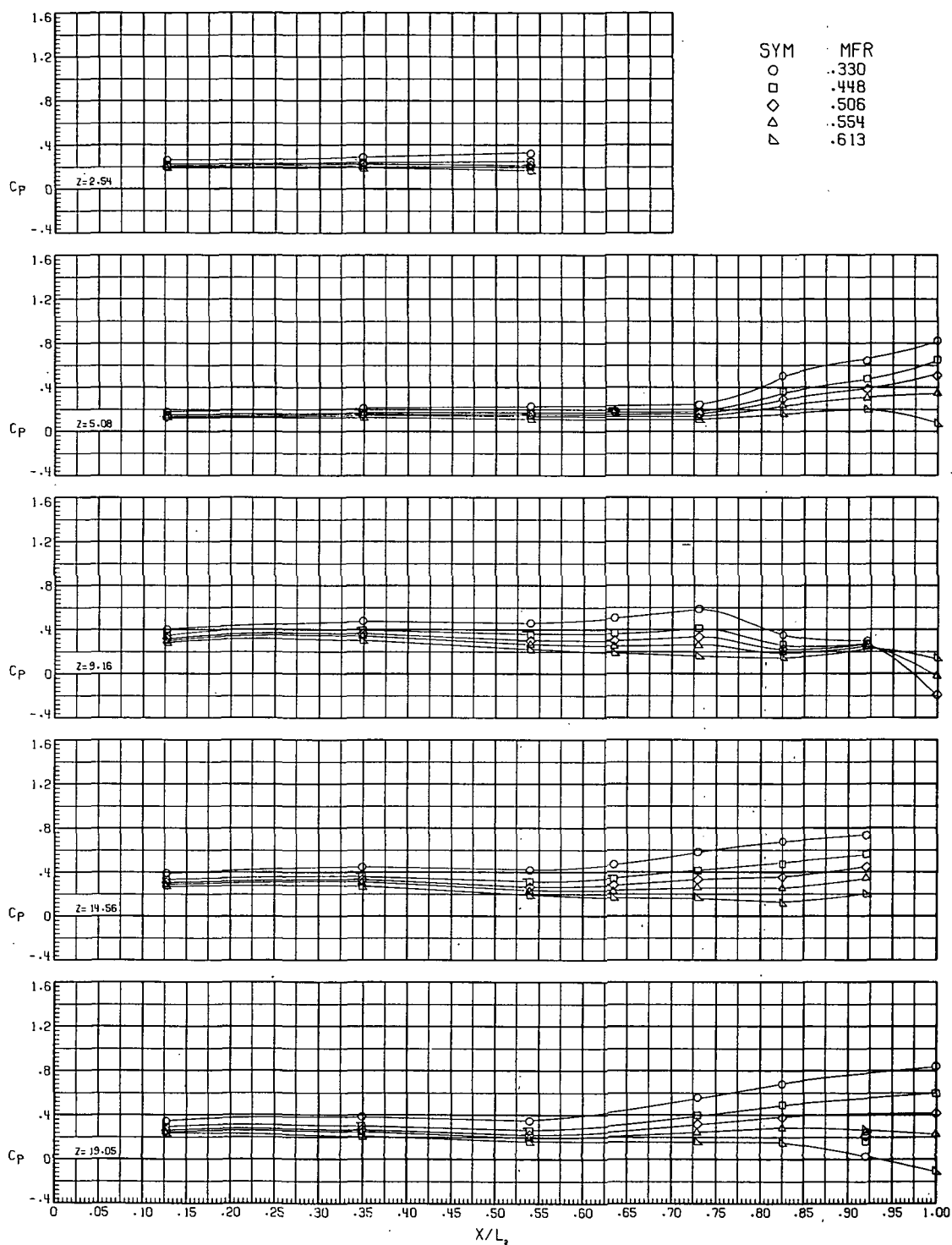
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29 - Continued.



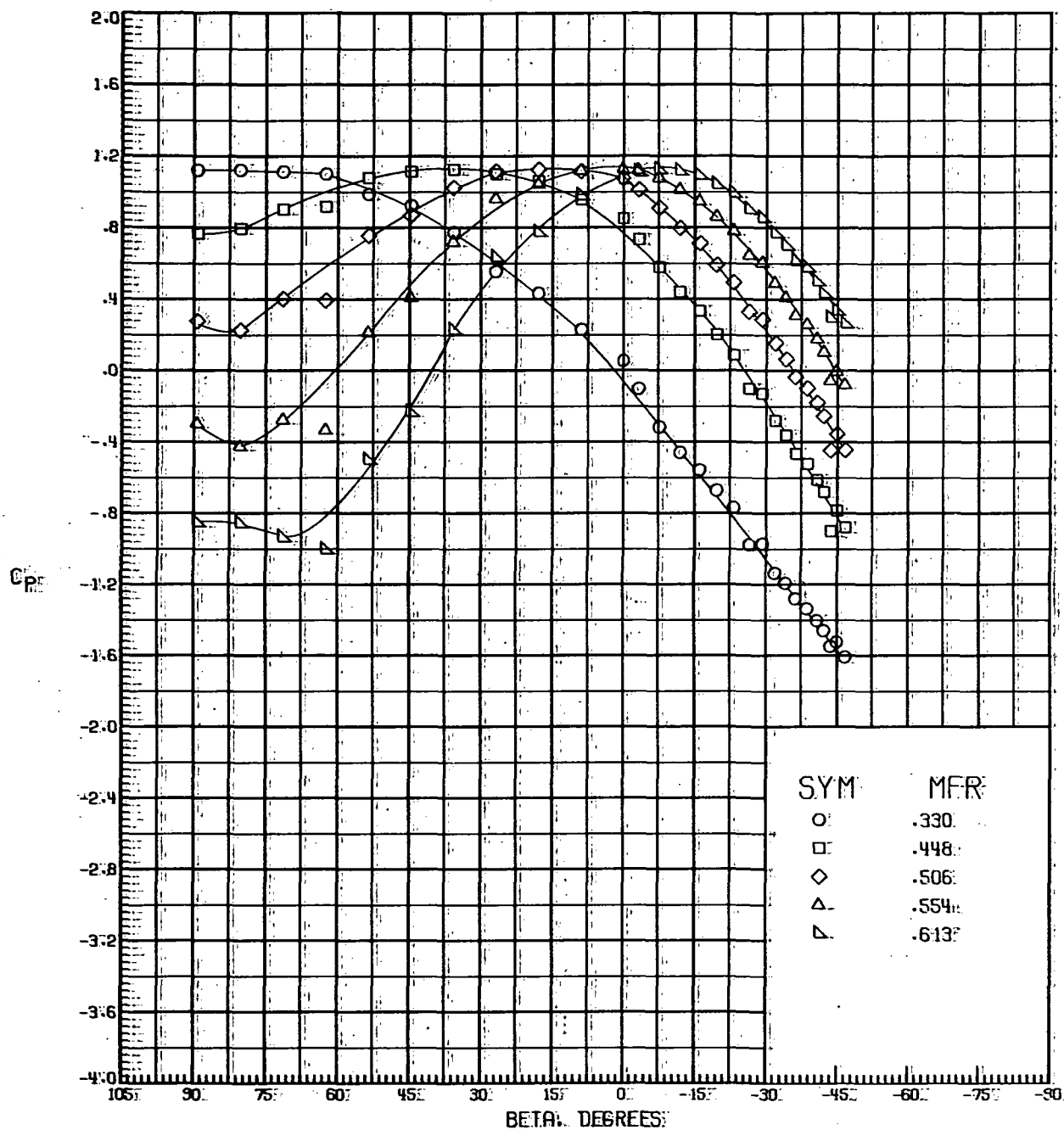
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



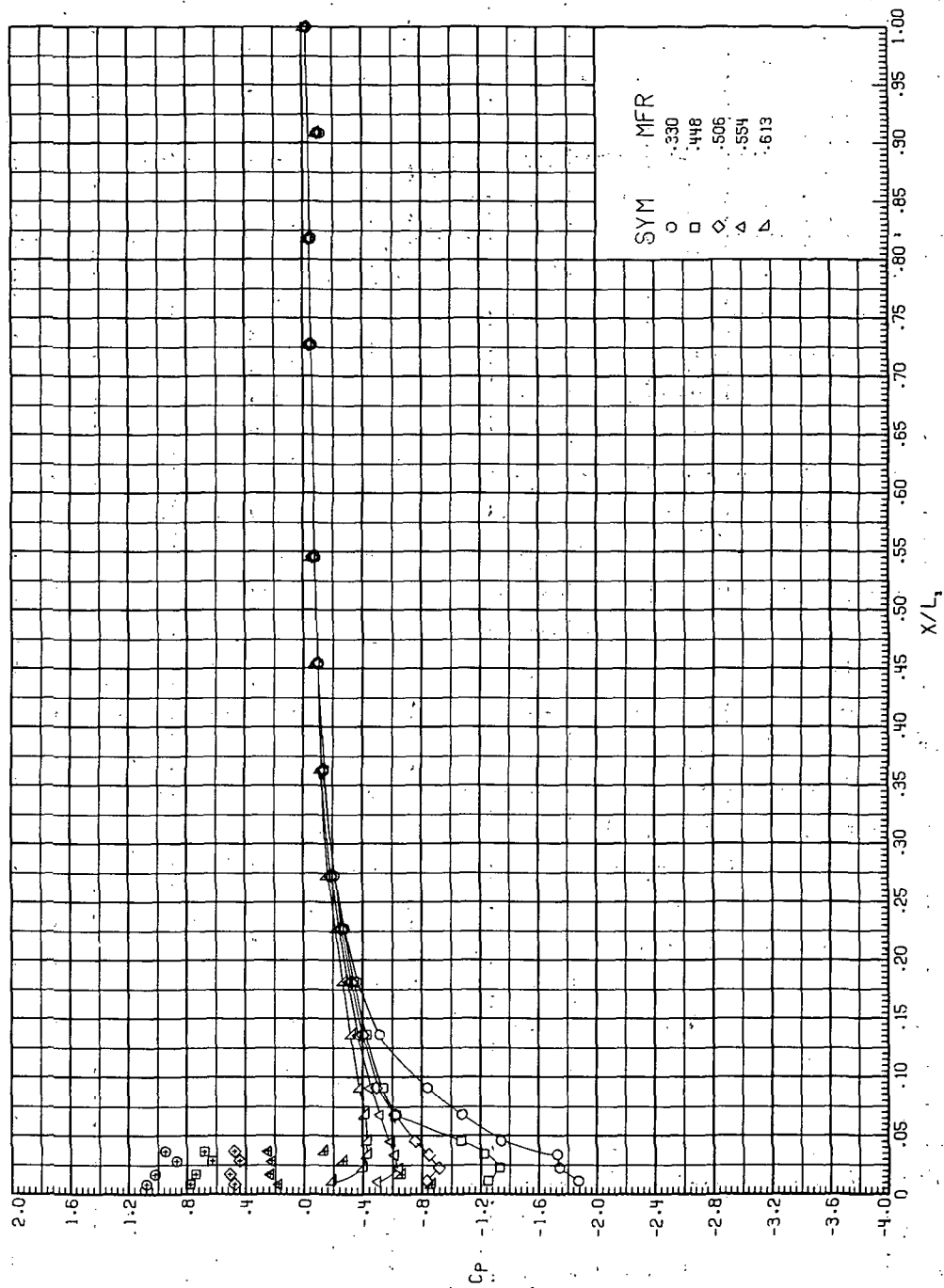
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



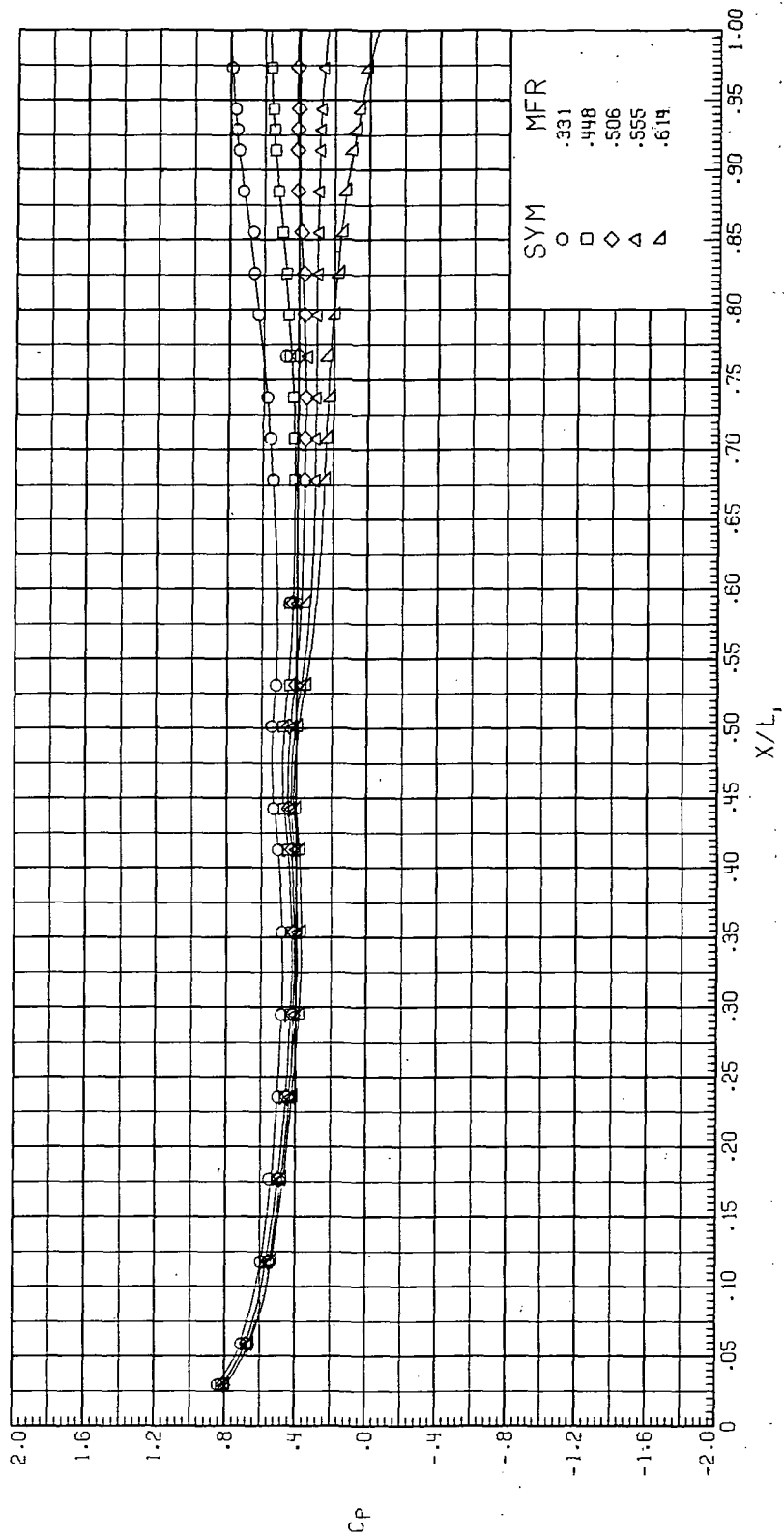
(e) $M=0.7$; $\alpha=4^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.--Continued.



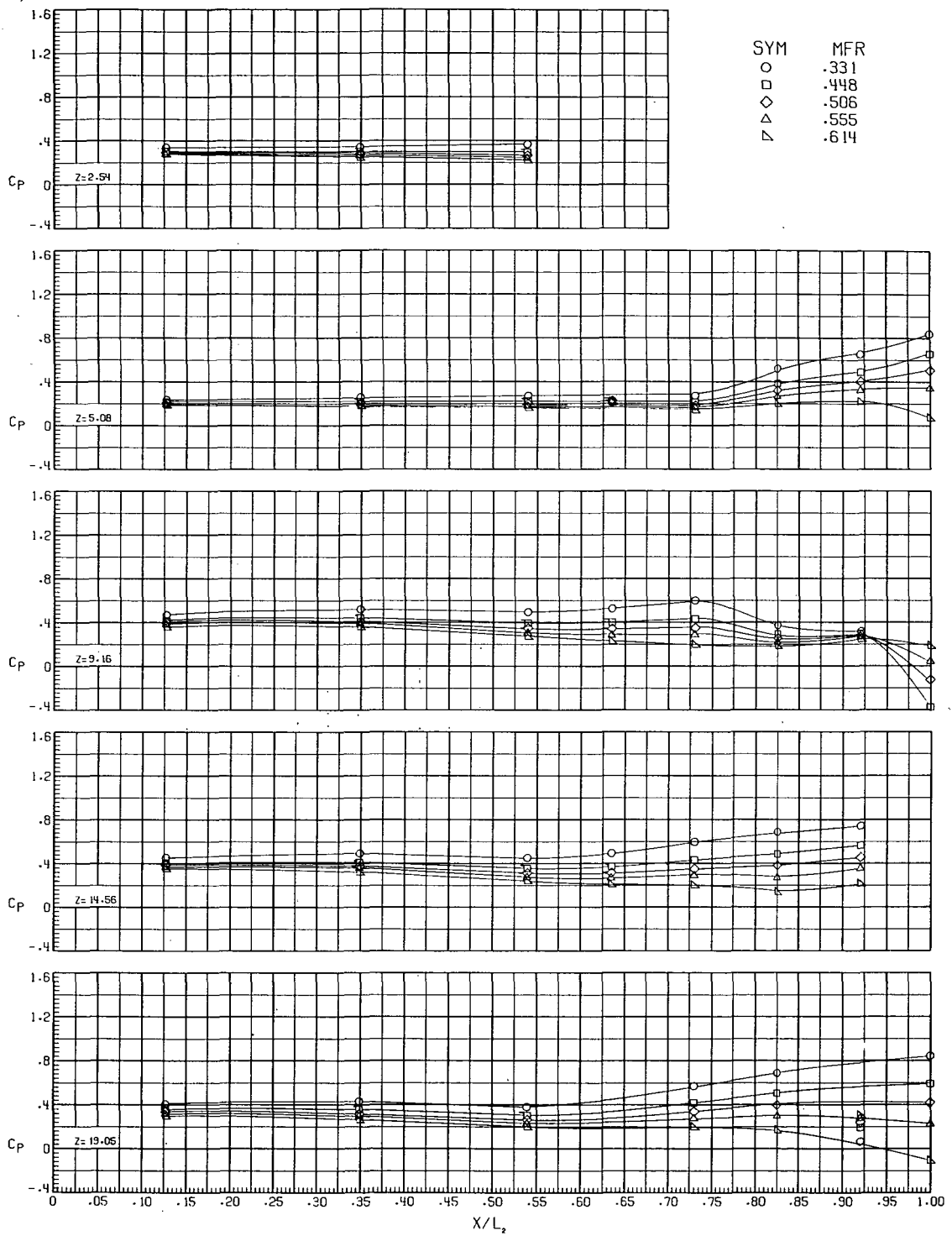
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Continued.



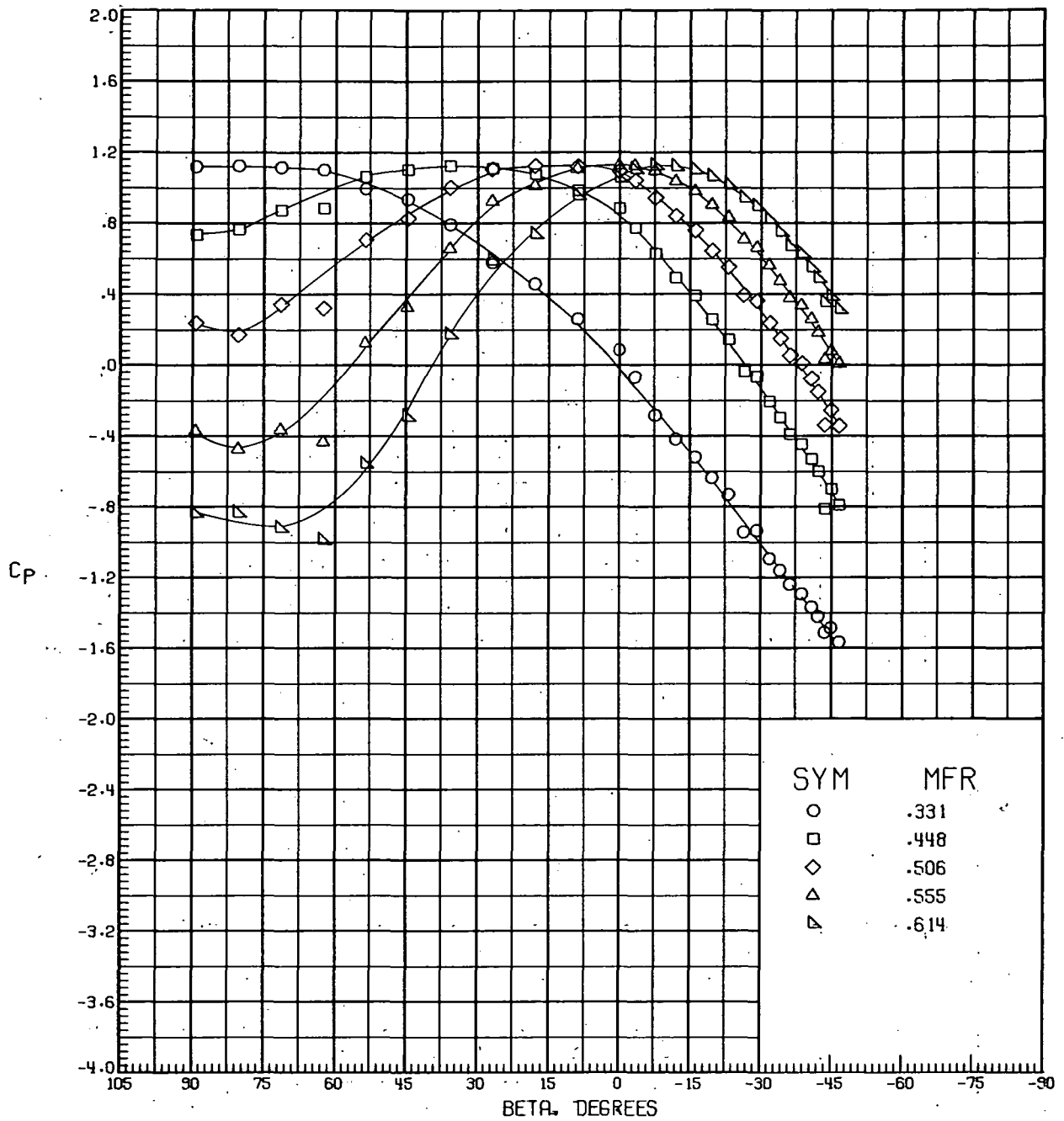
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 29.- Continued.



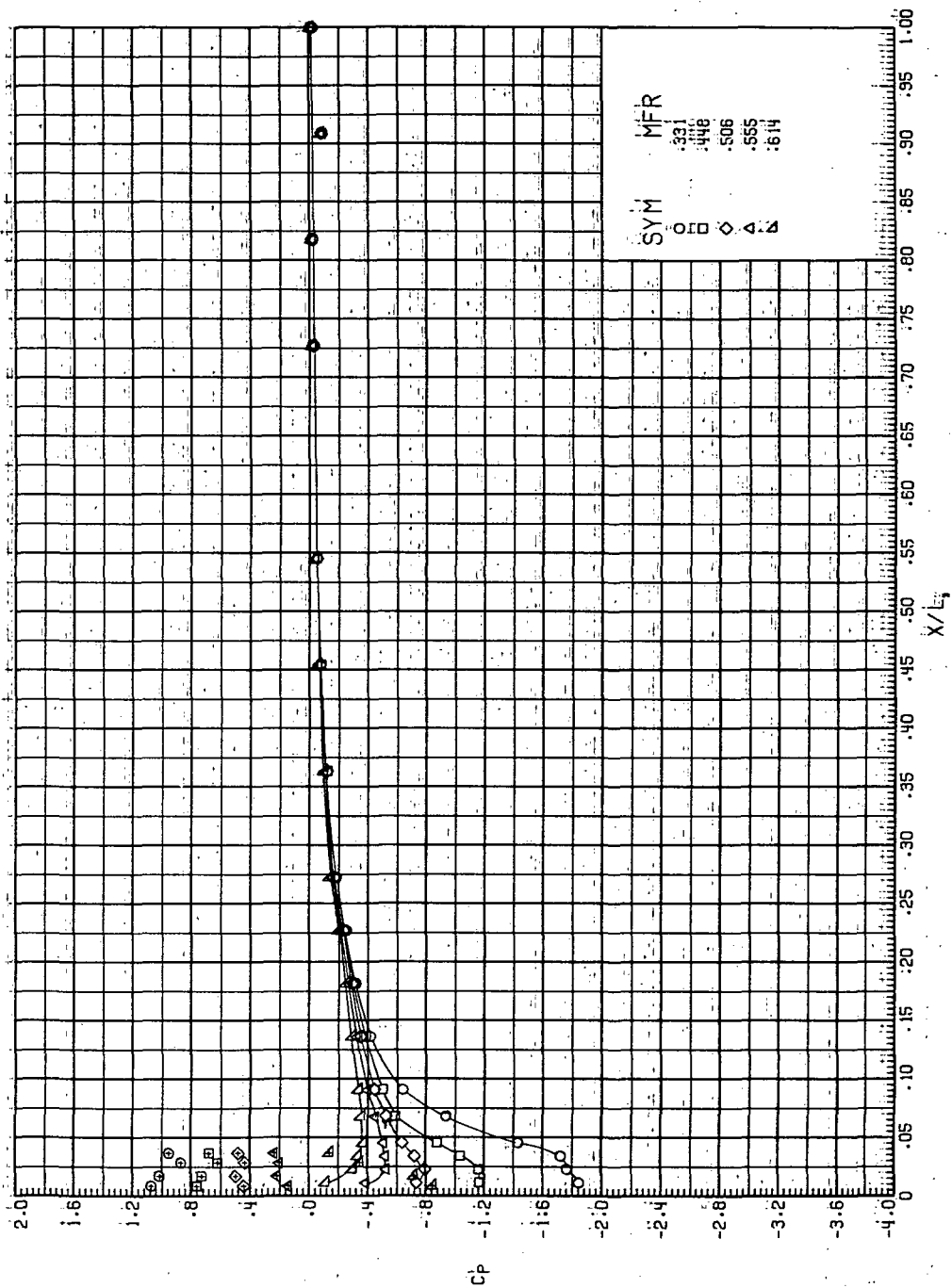
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



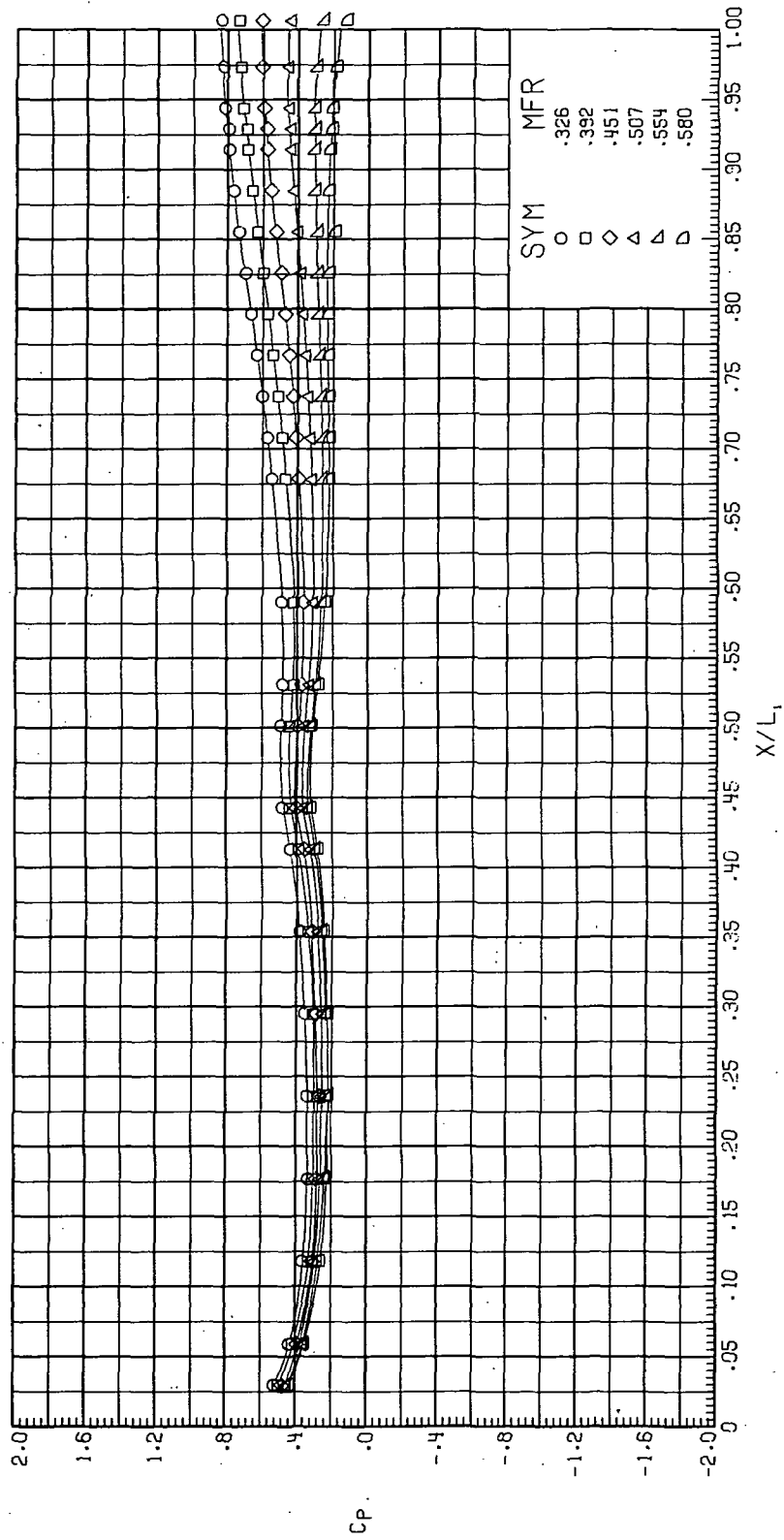
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



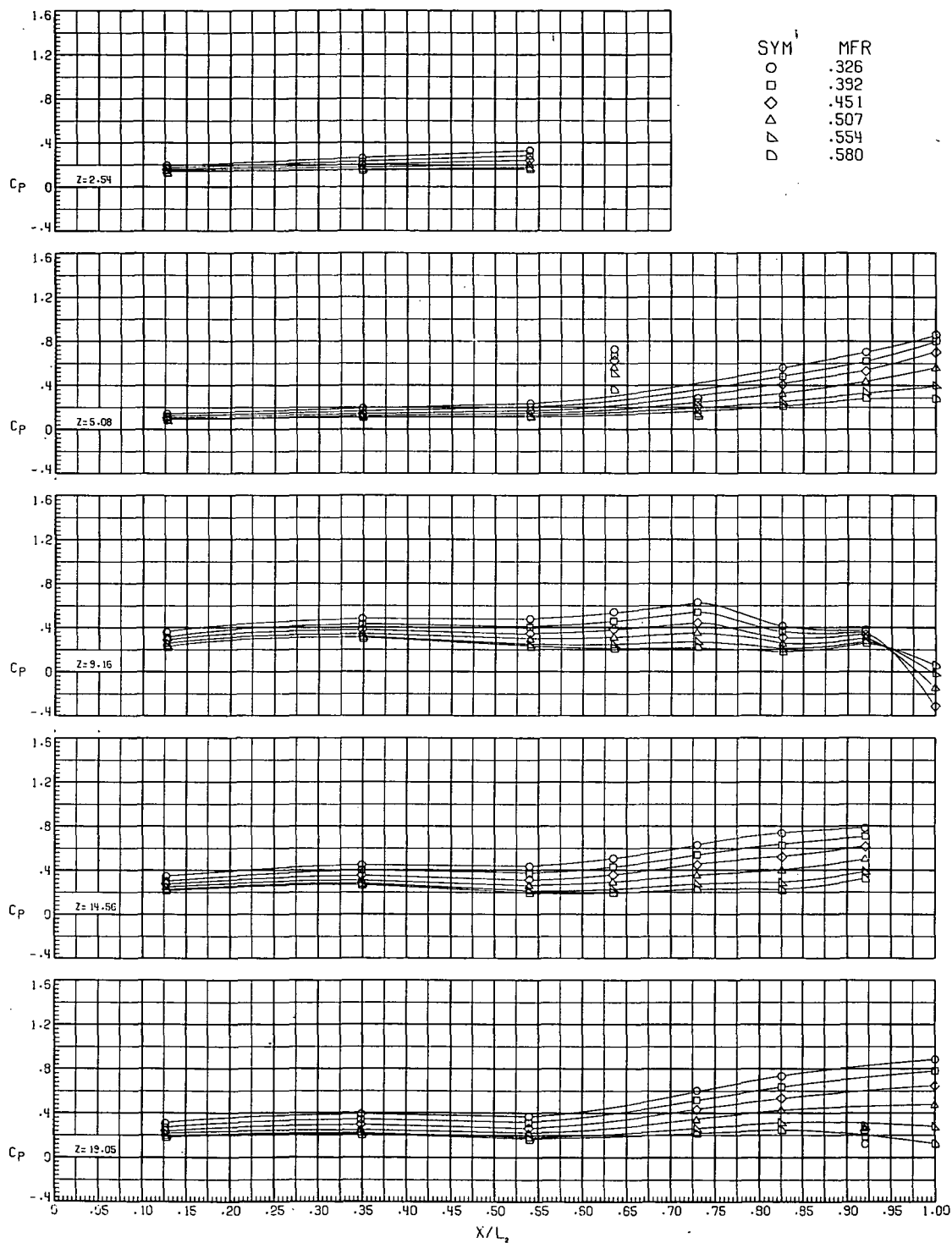
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Continued.



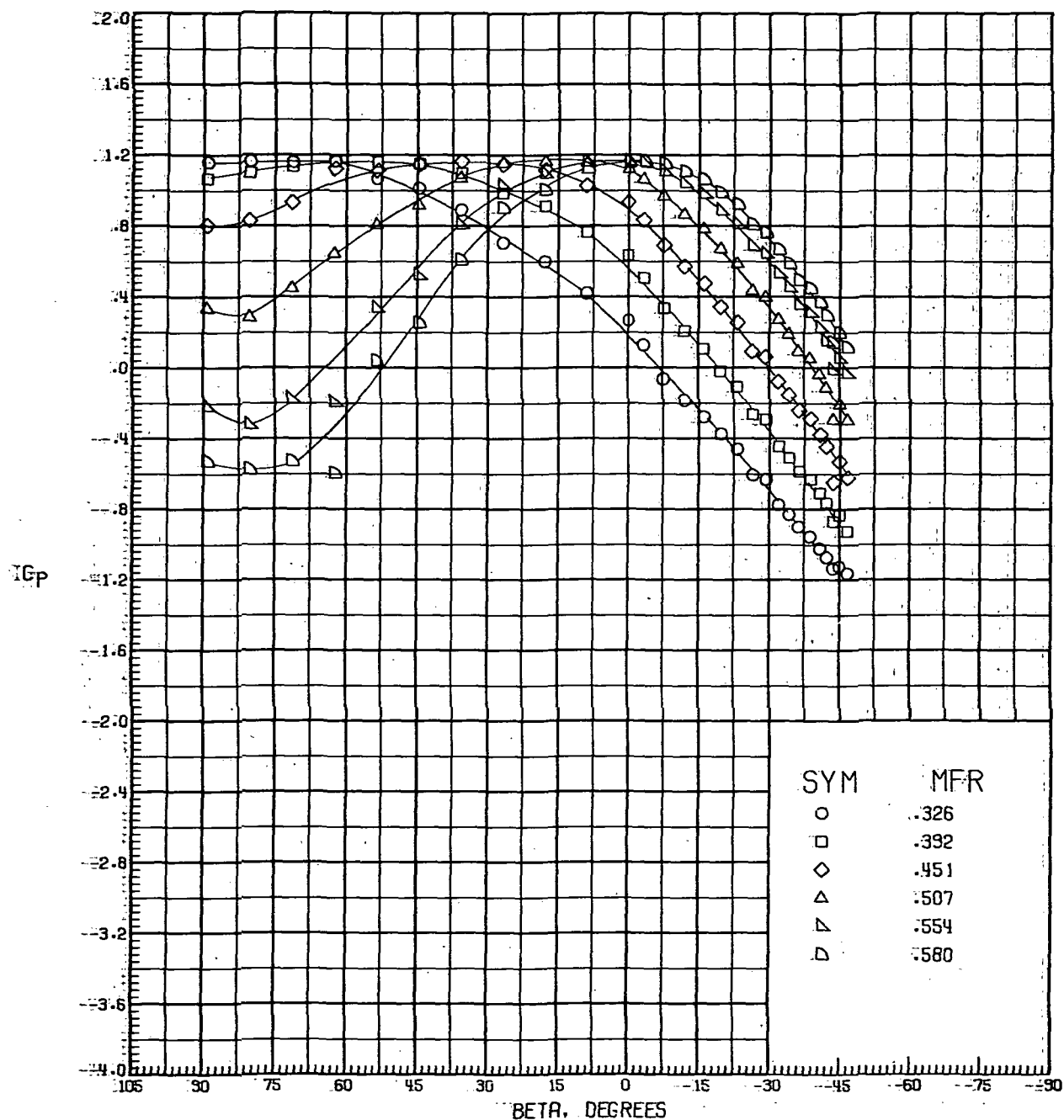
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



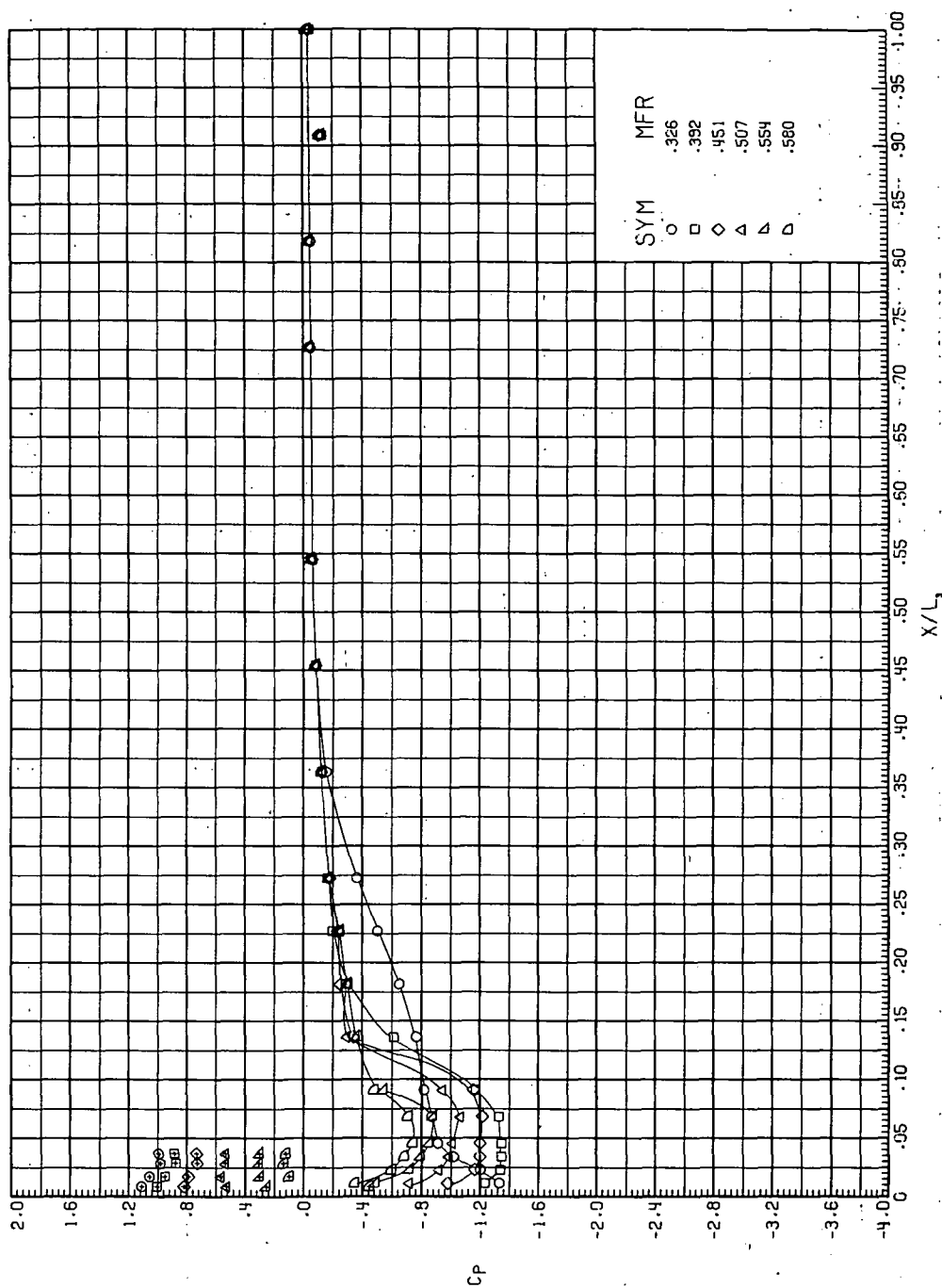
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



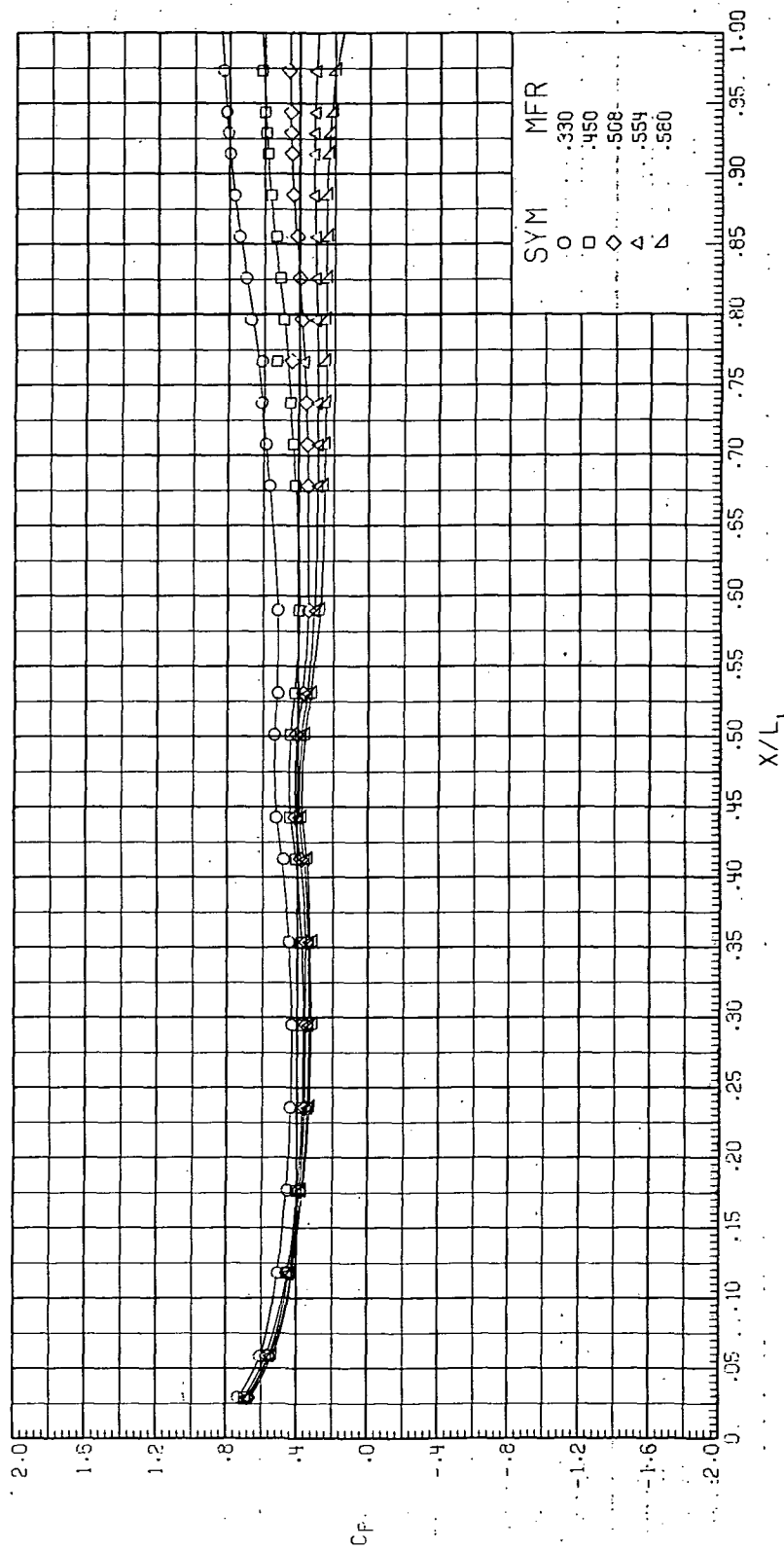
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



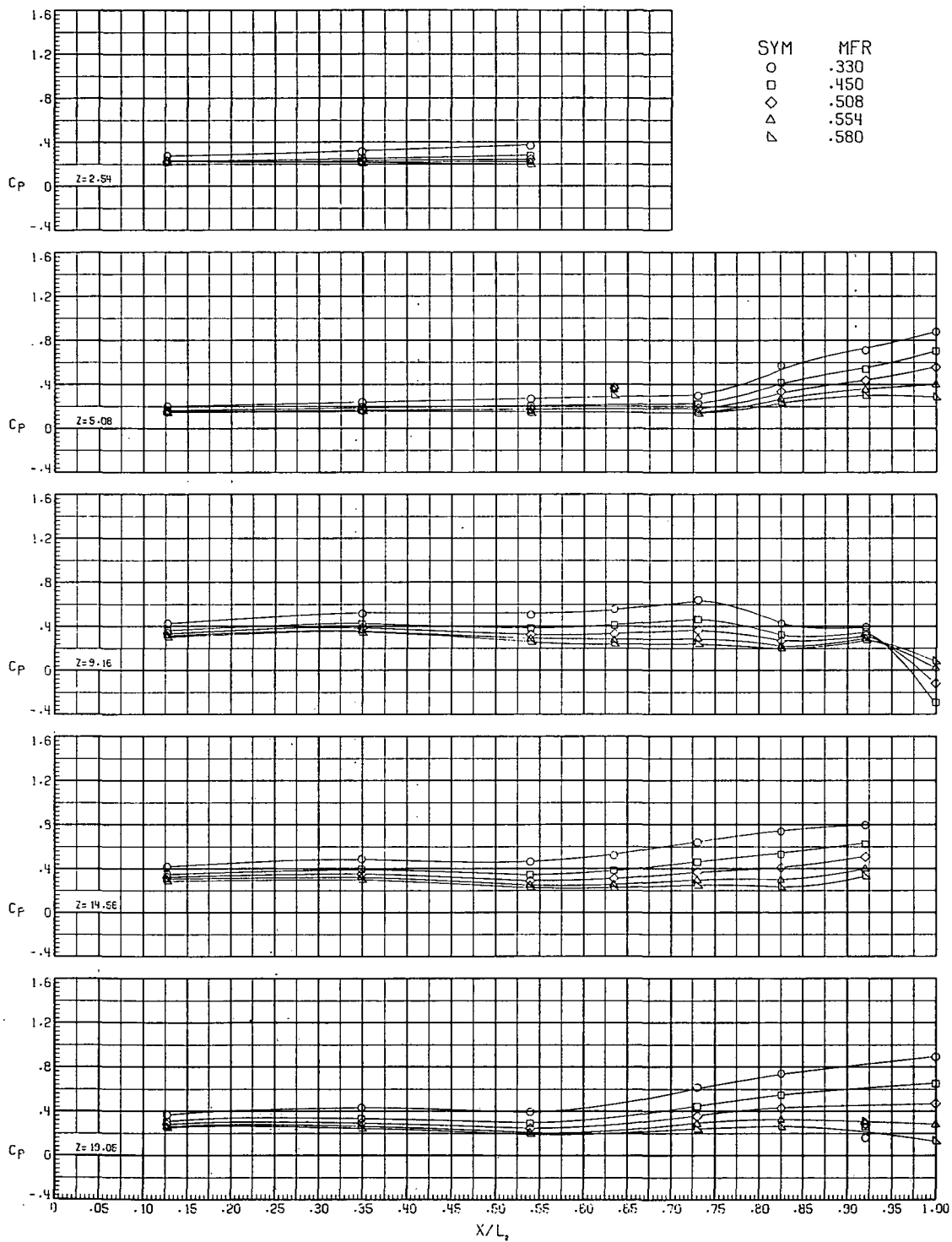
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Continued.



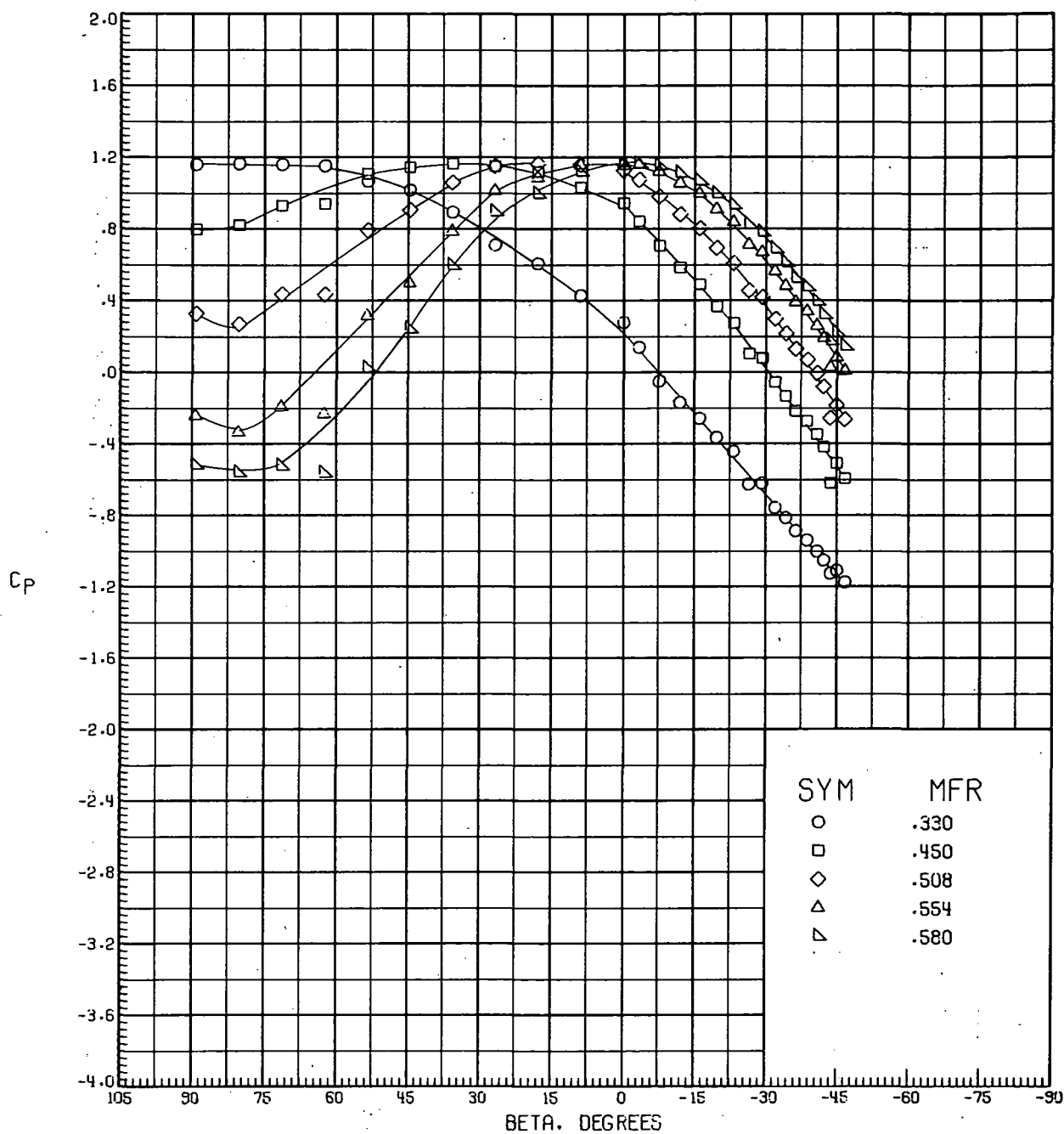
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



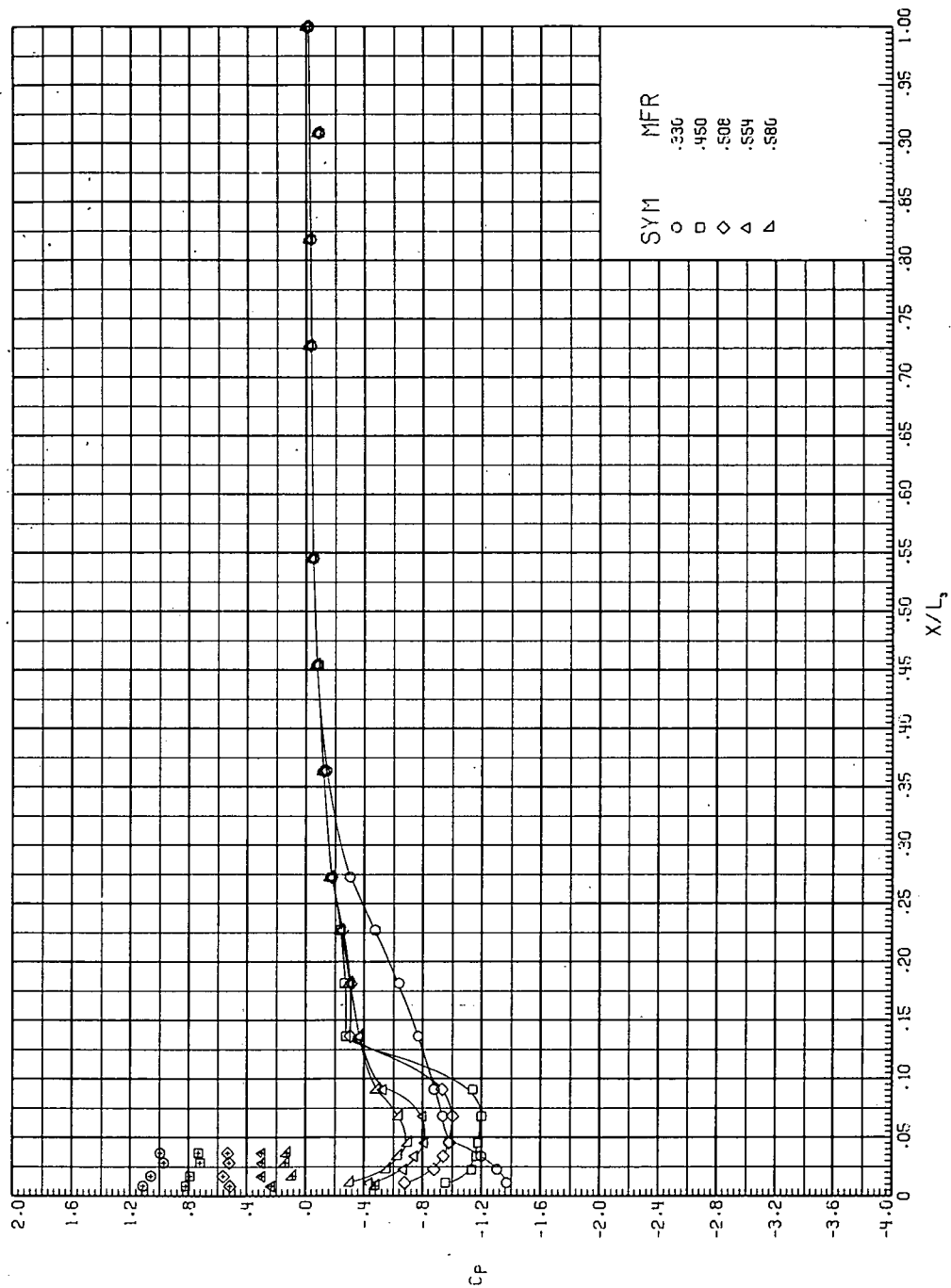
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



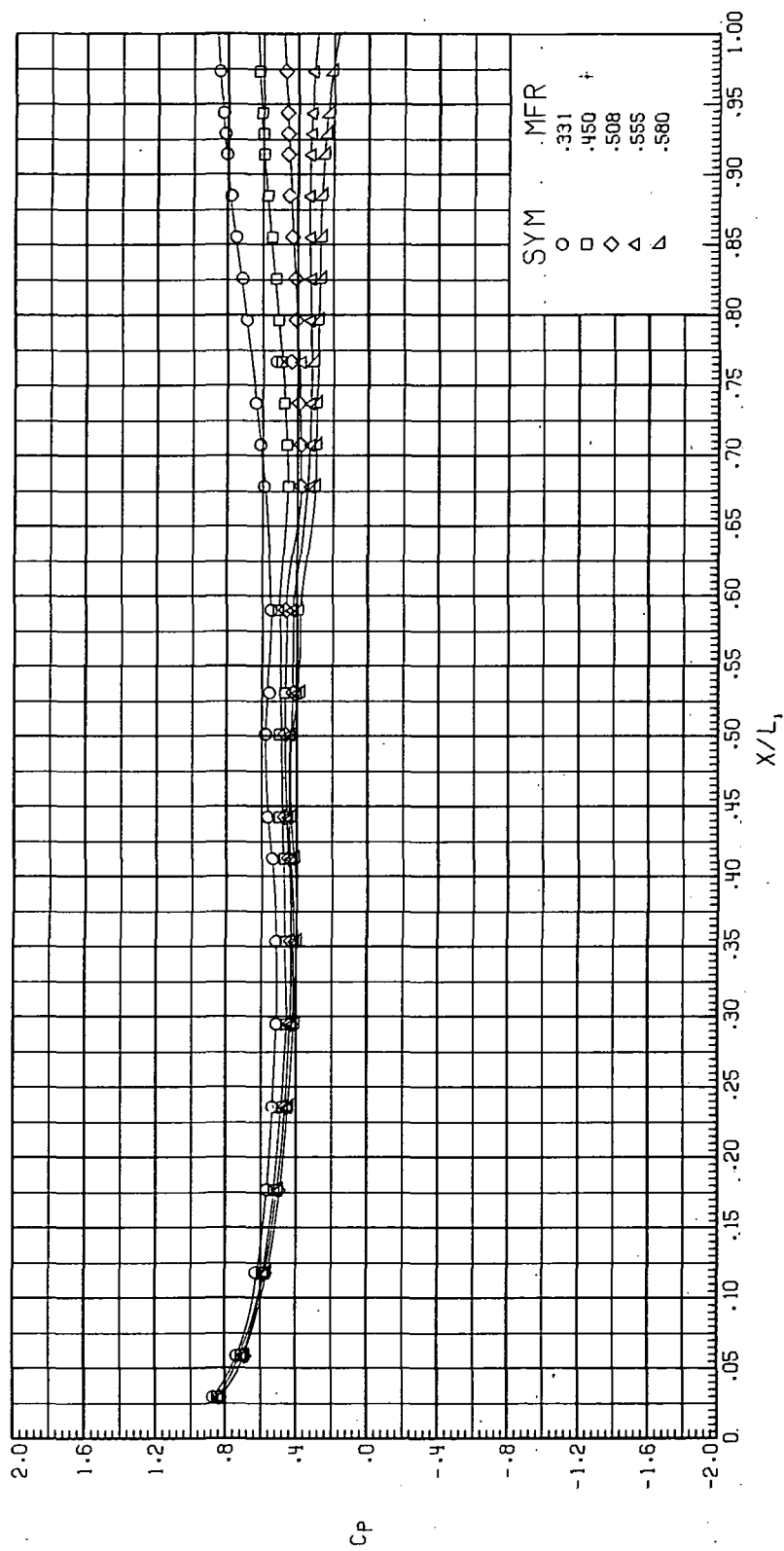
(h) $M = 0.8$; $\alpha = 40^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



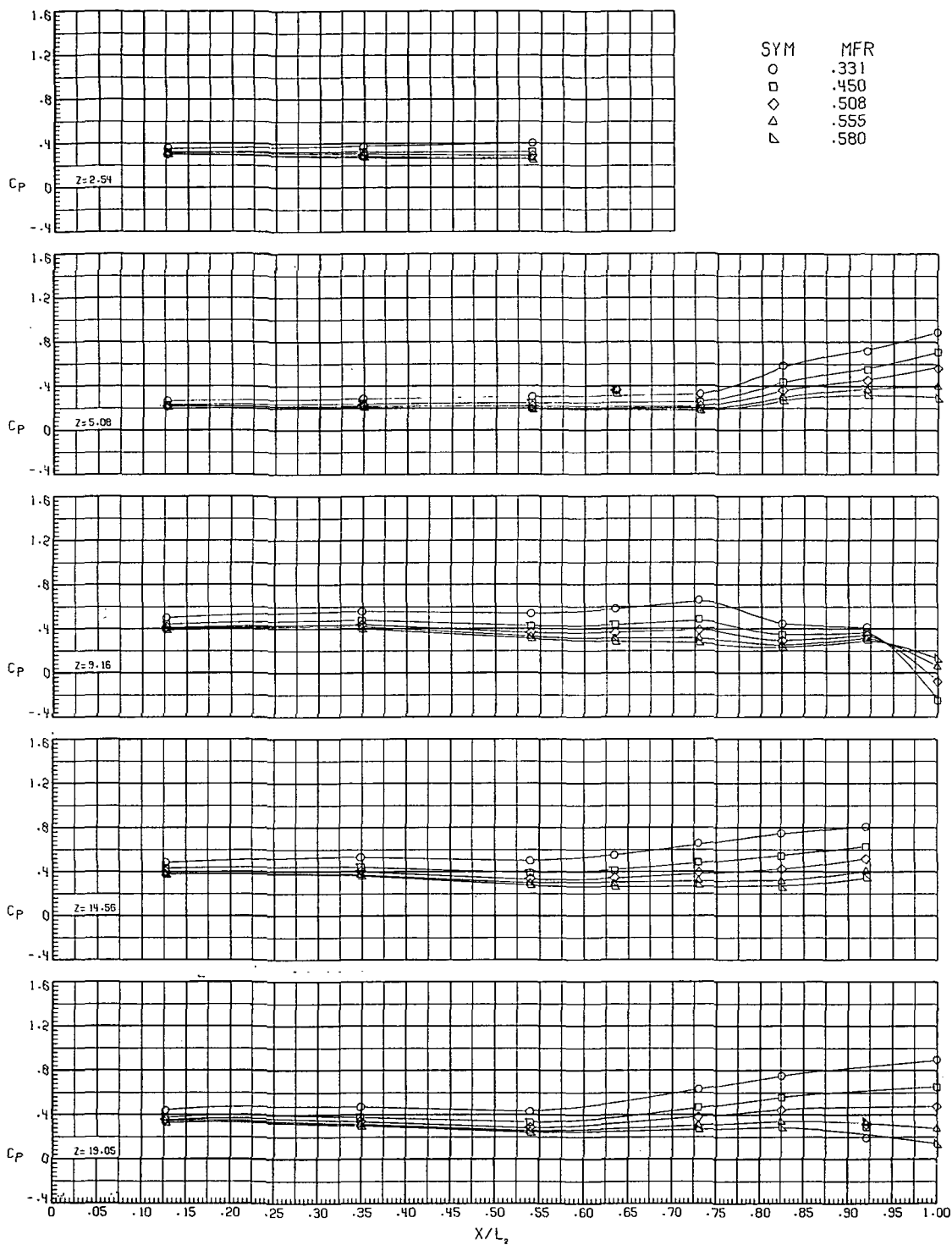
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29. - Continued.



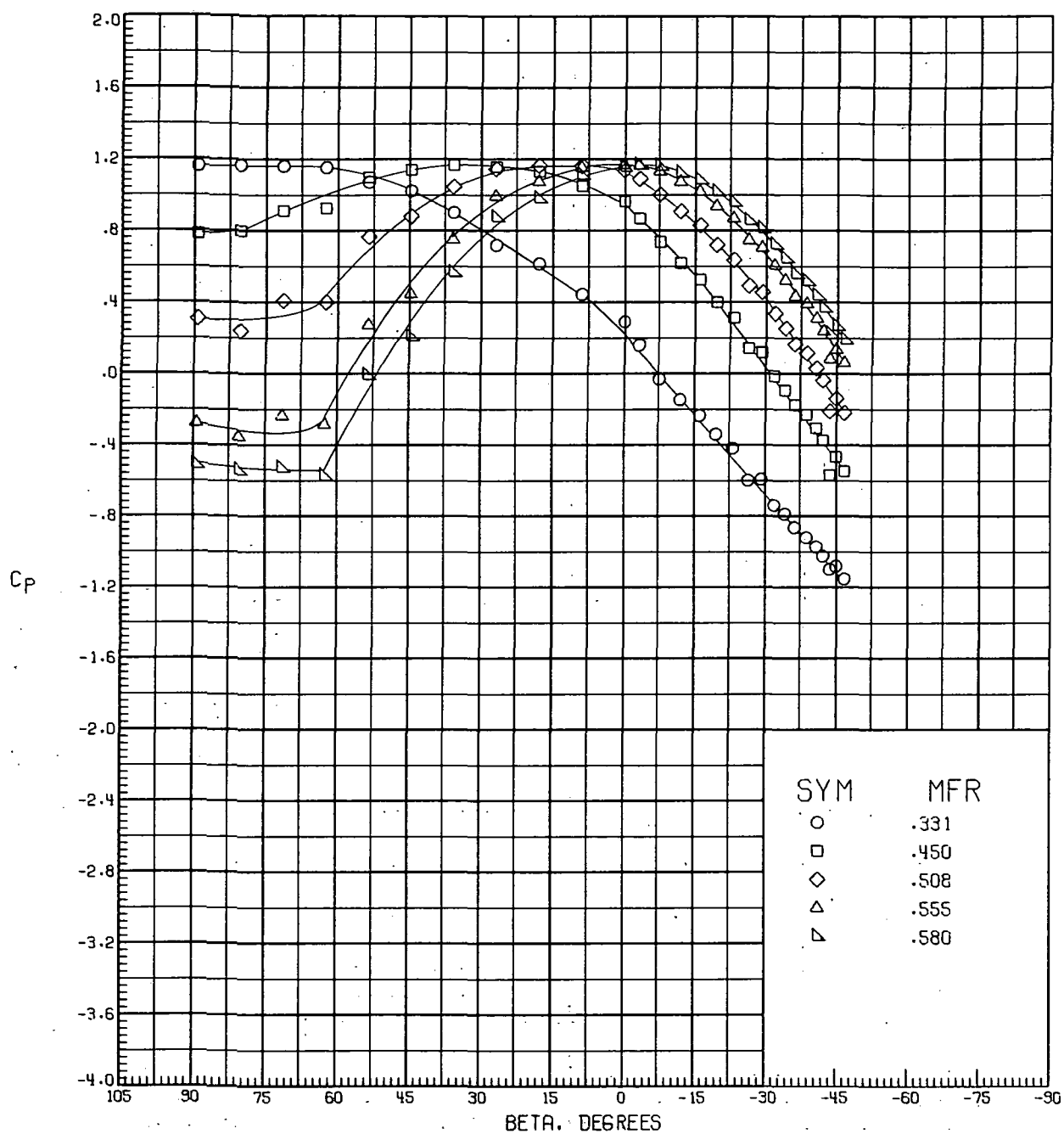
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 29. - Continued.



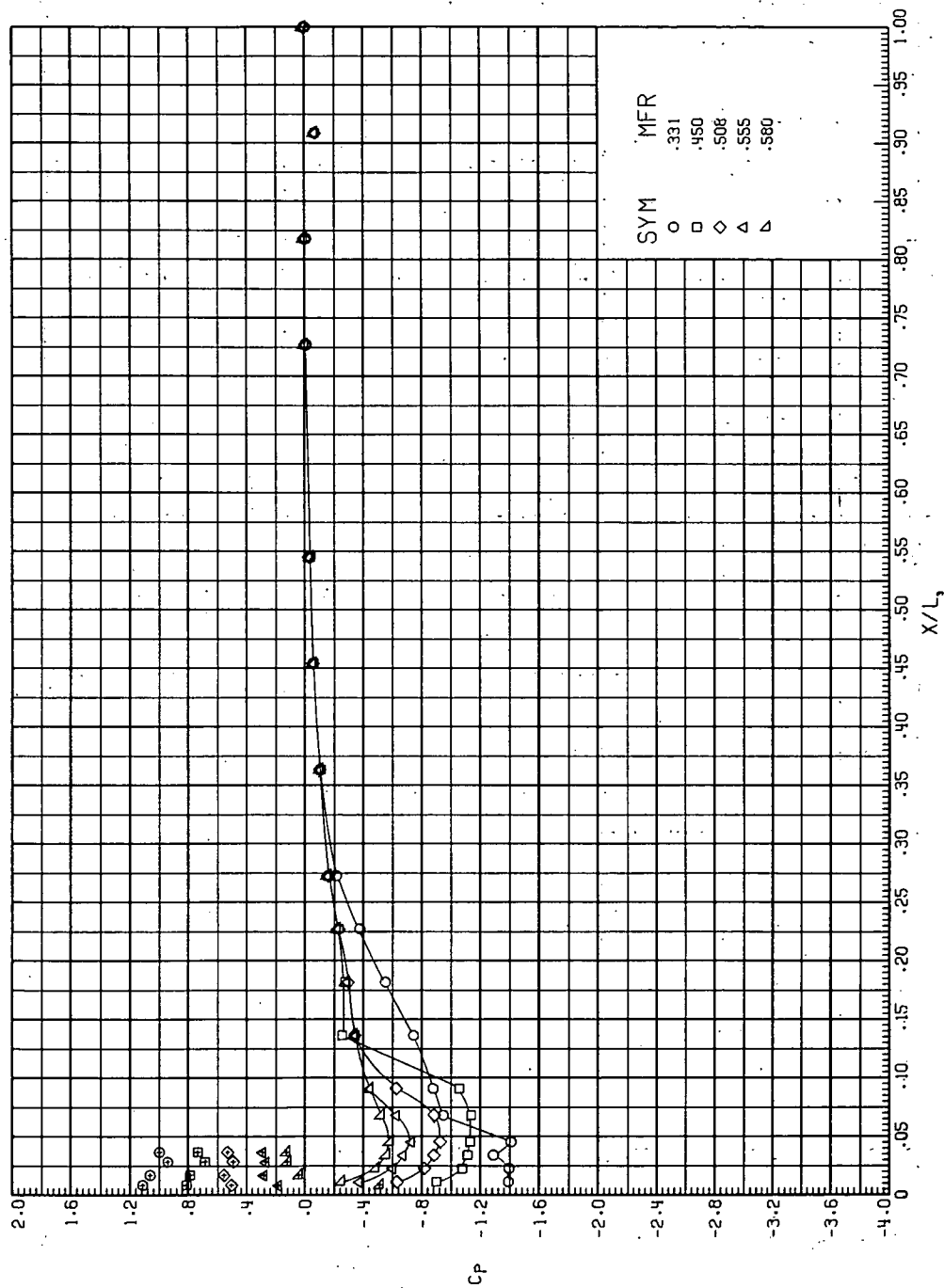
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 29.- Continued.



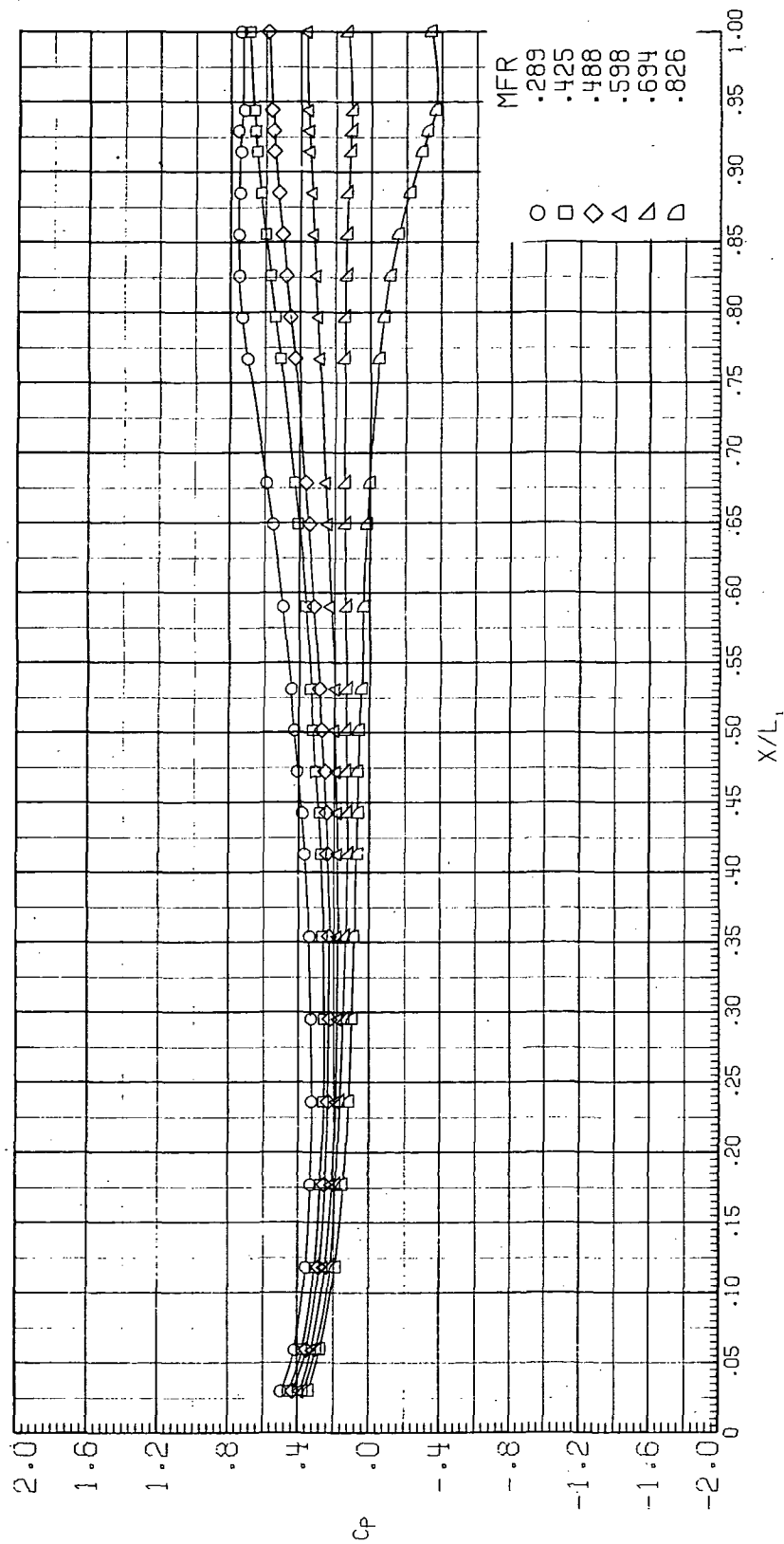
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 29.- Continued.



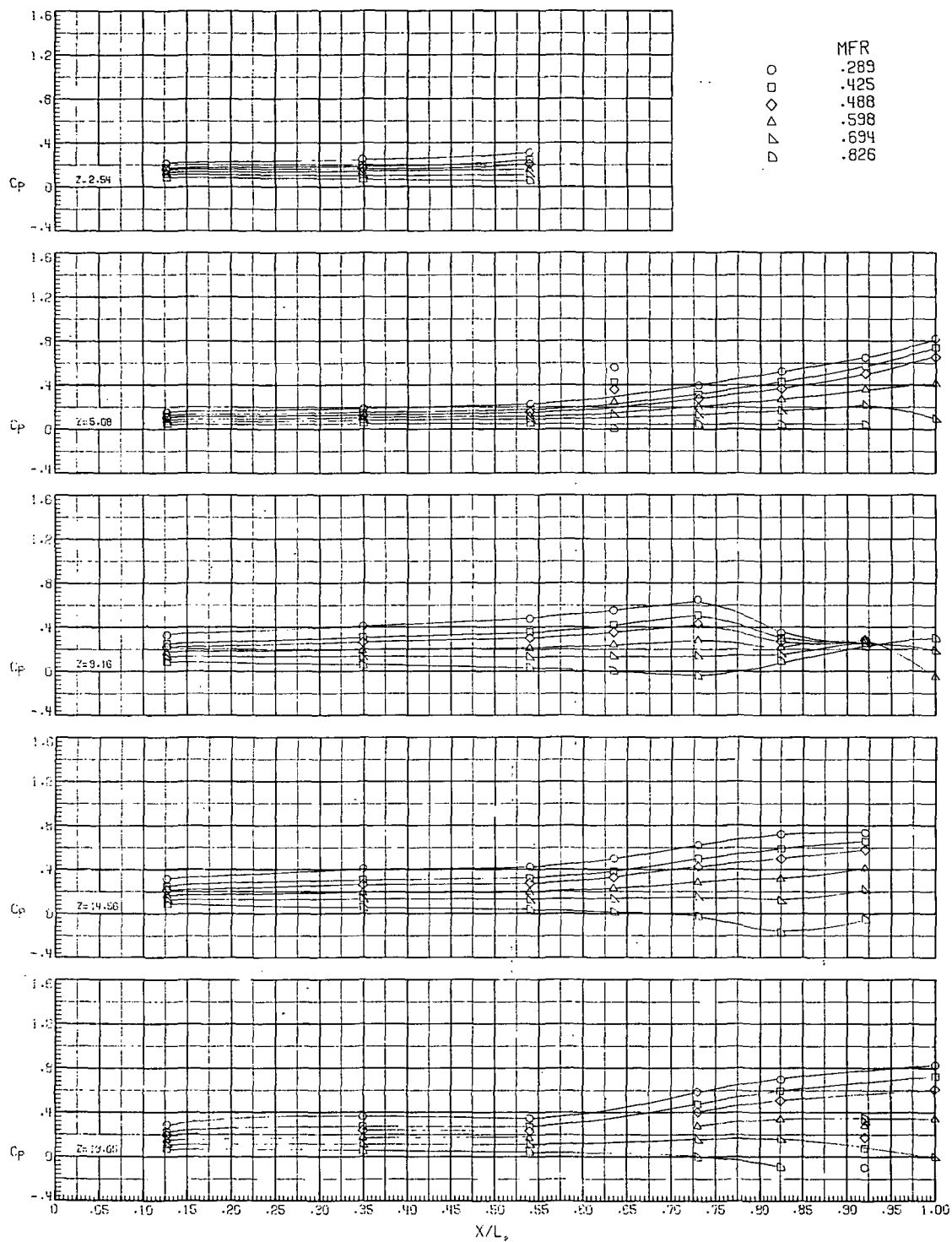
(i) $M = 0.8$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 29.- Concluded.



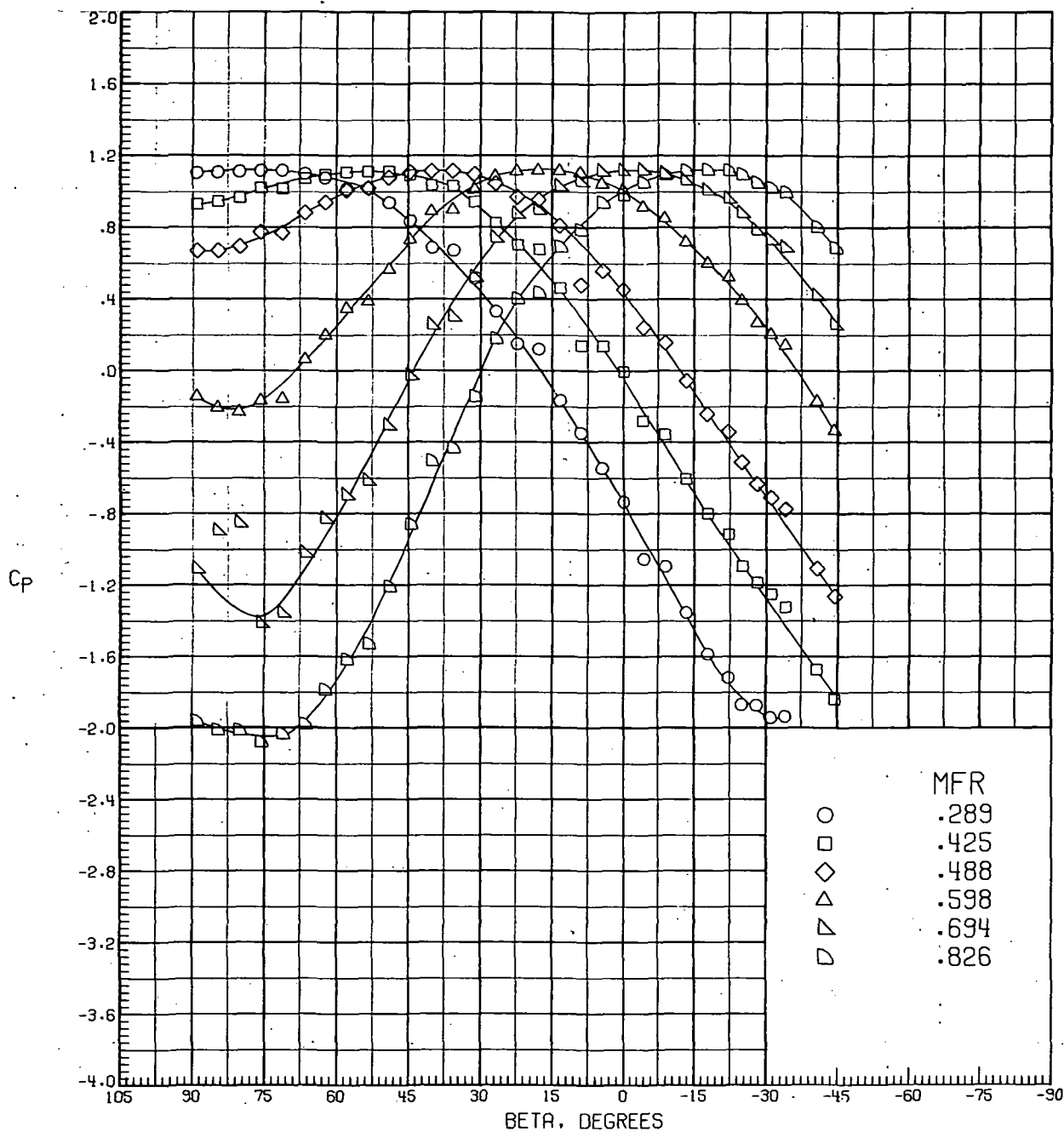
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 30.- Pressure coefficients for cowl 90-3. $\delta_1 = \delta_2 = 5^\circ$.



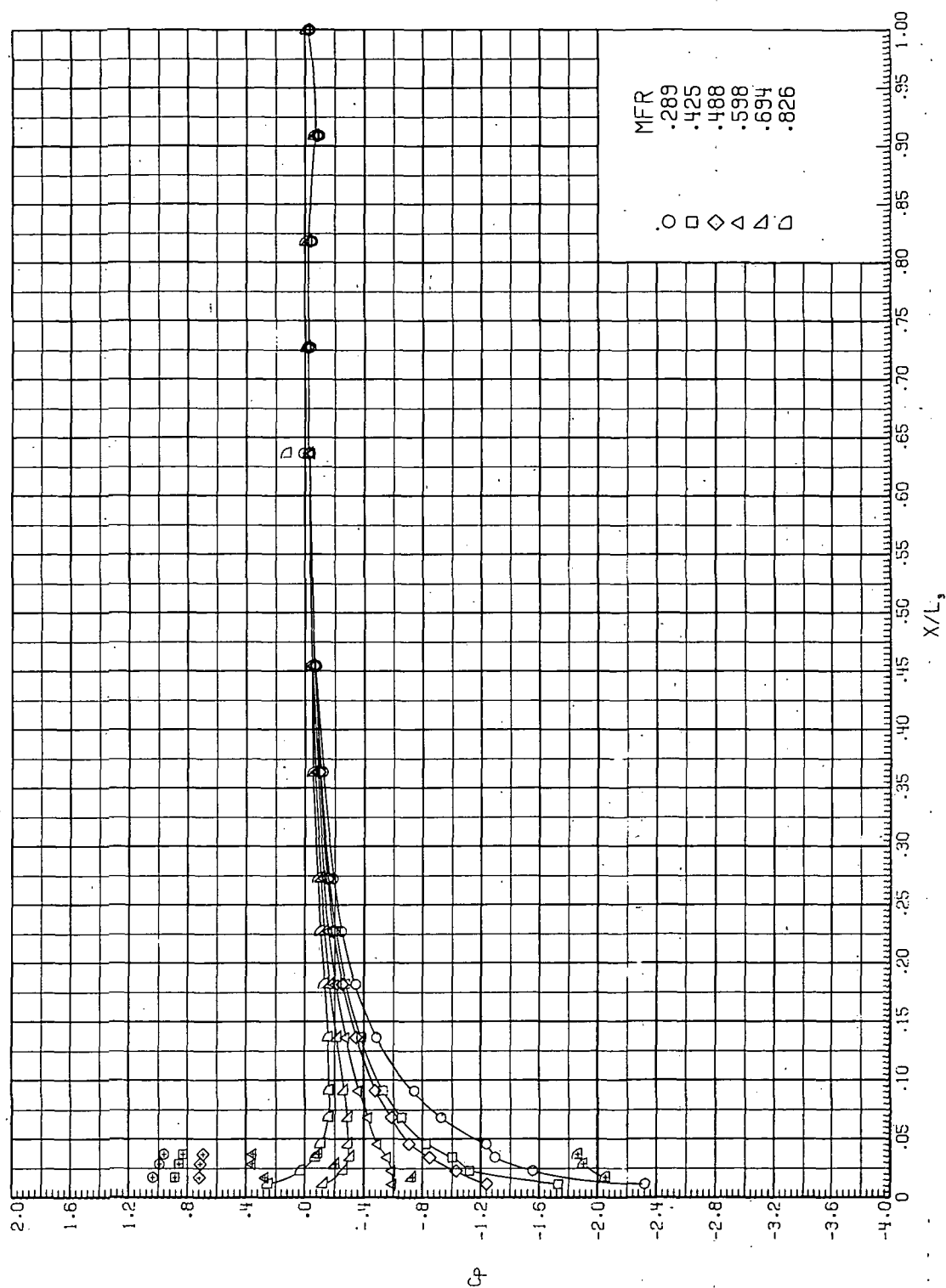
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



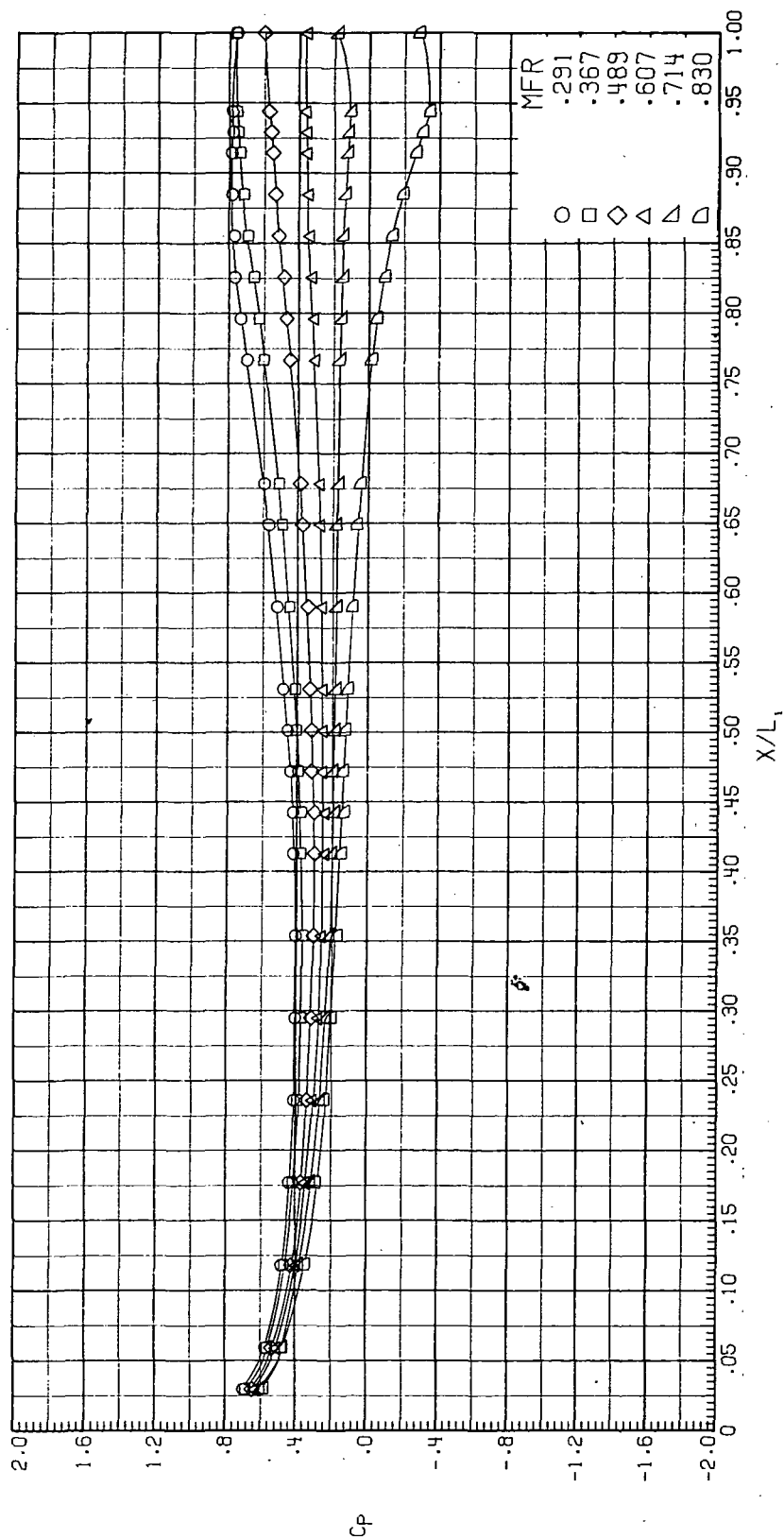
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



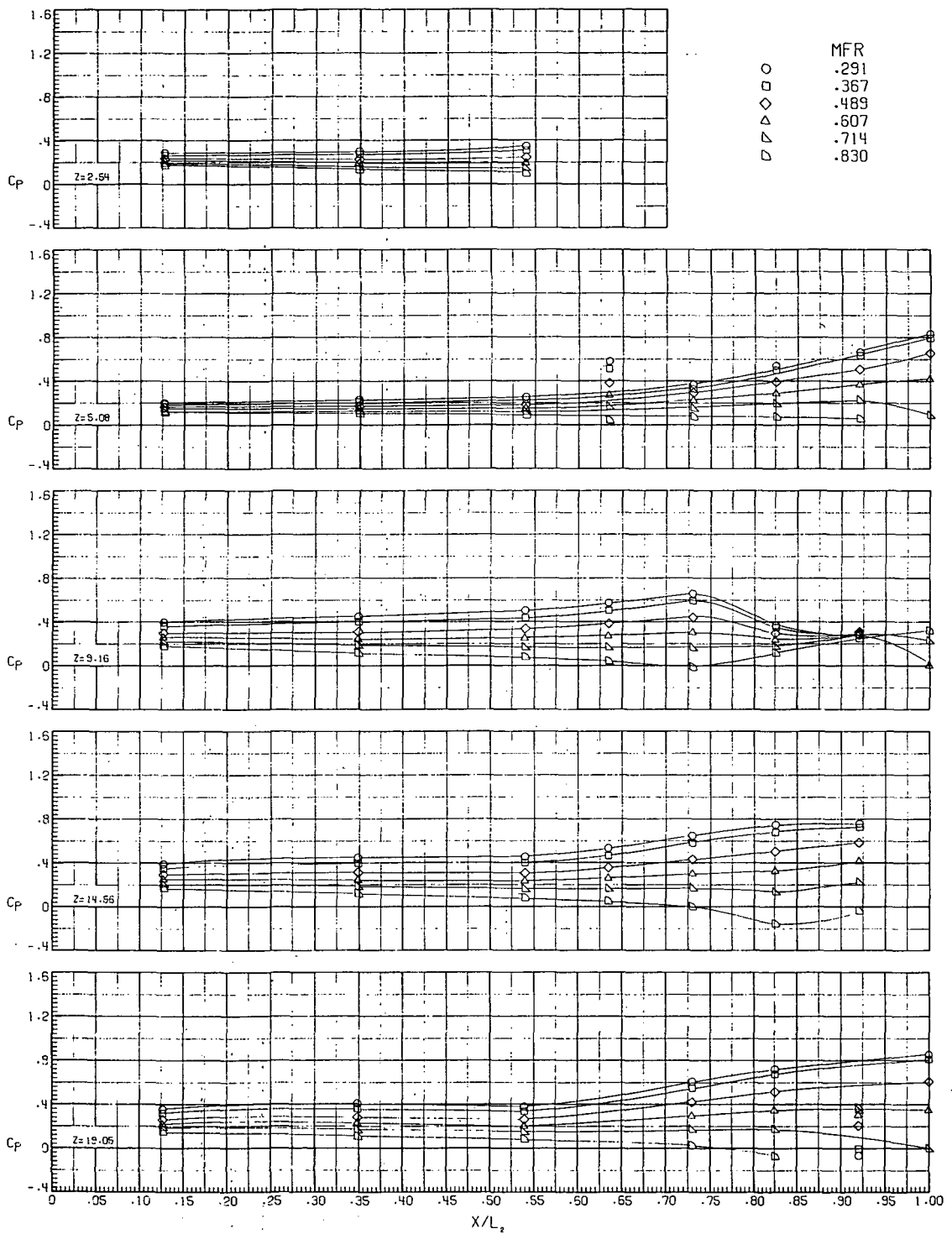
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30. - Continued.



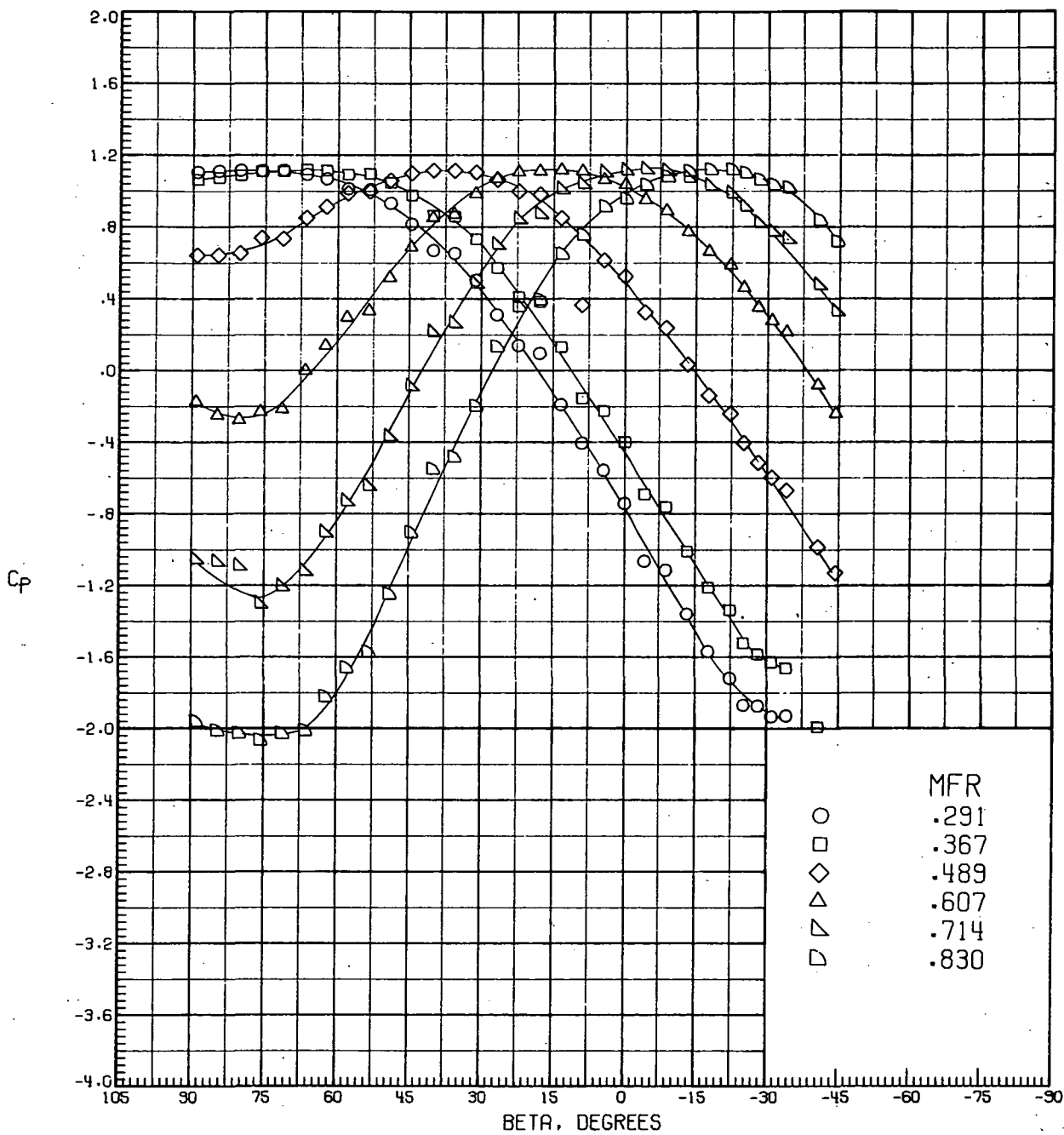
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



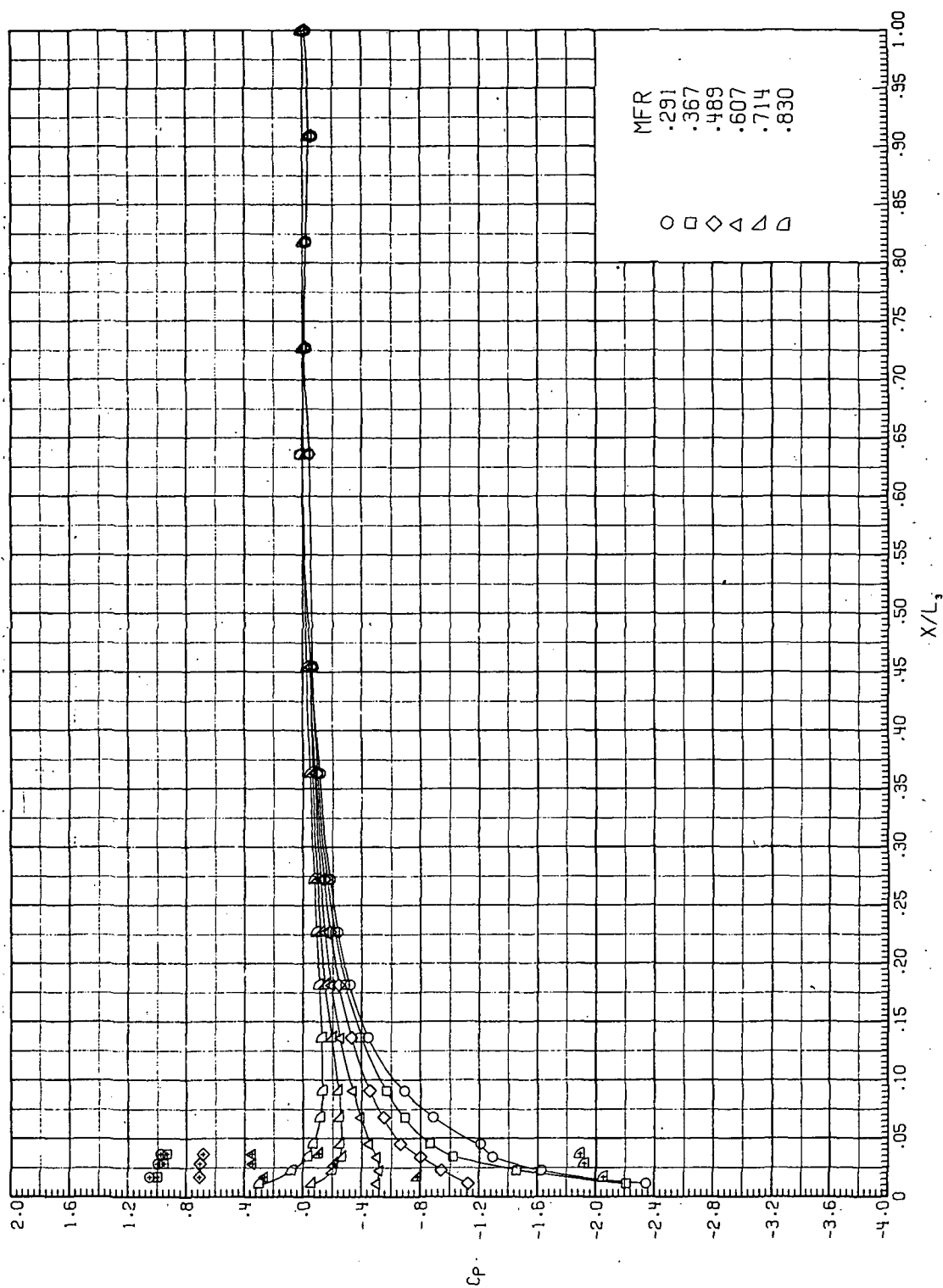
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



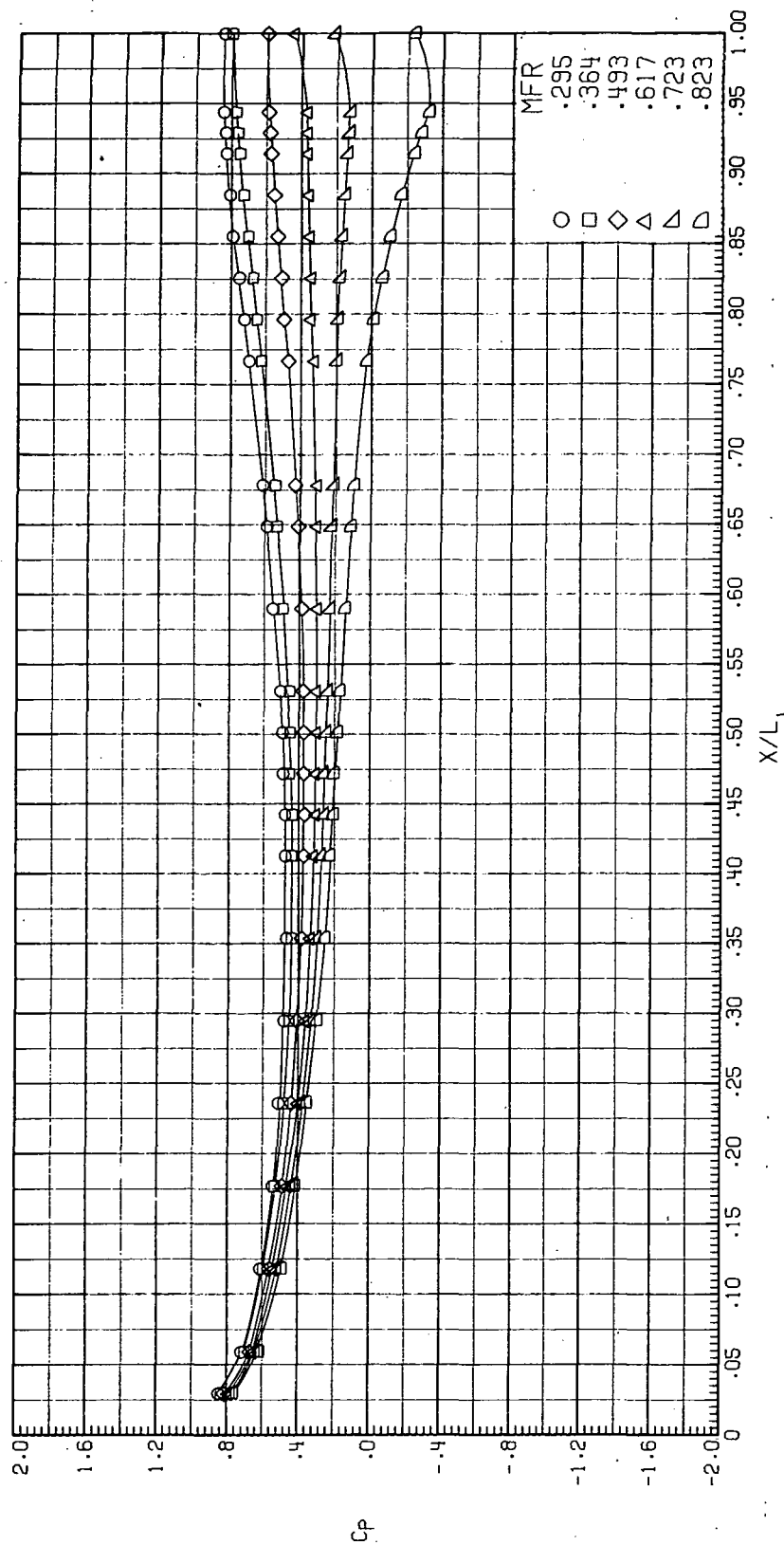
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



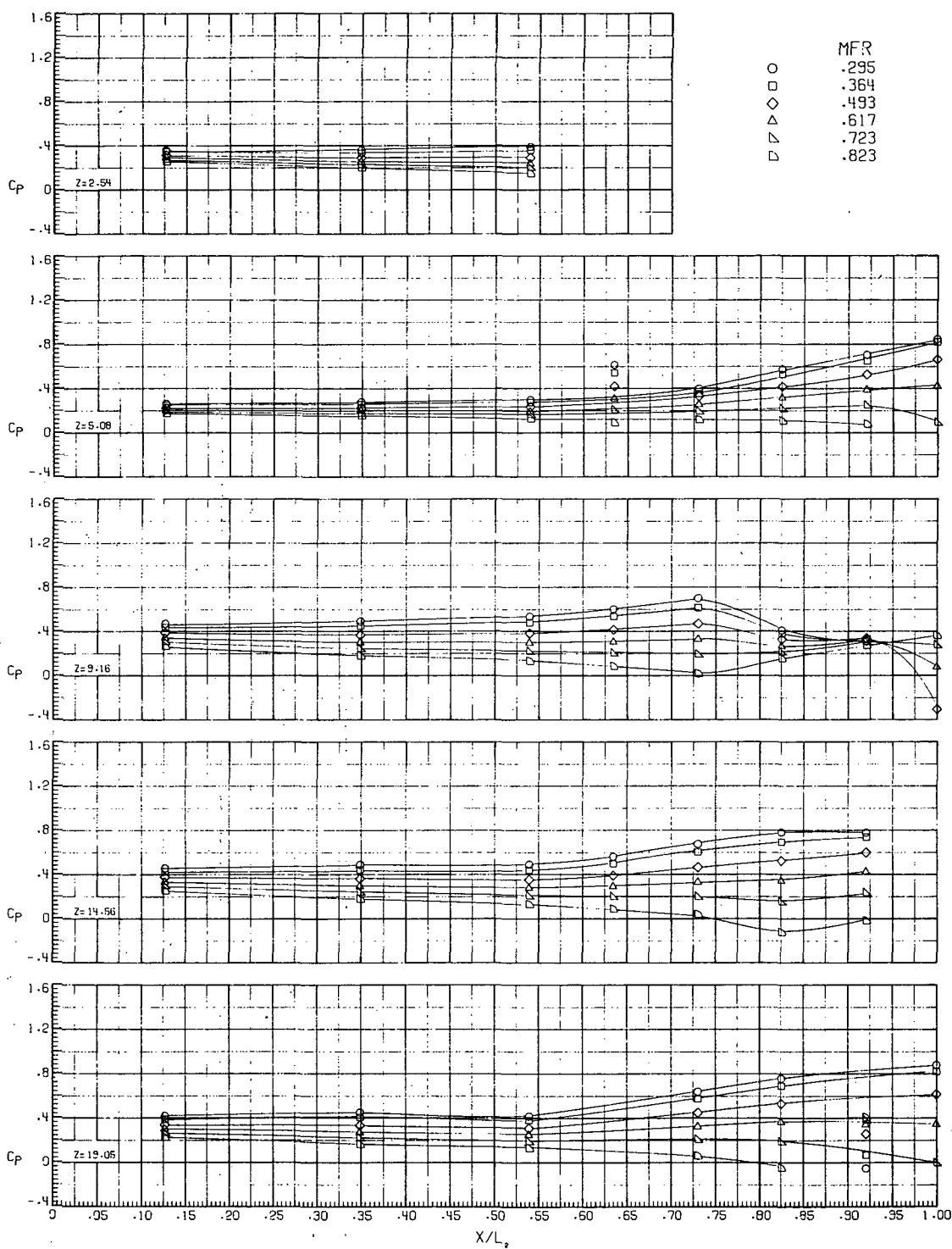
(b) $M = 0.6$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30. - Continued.



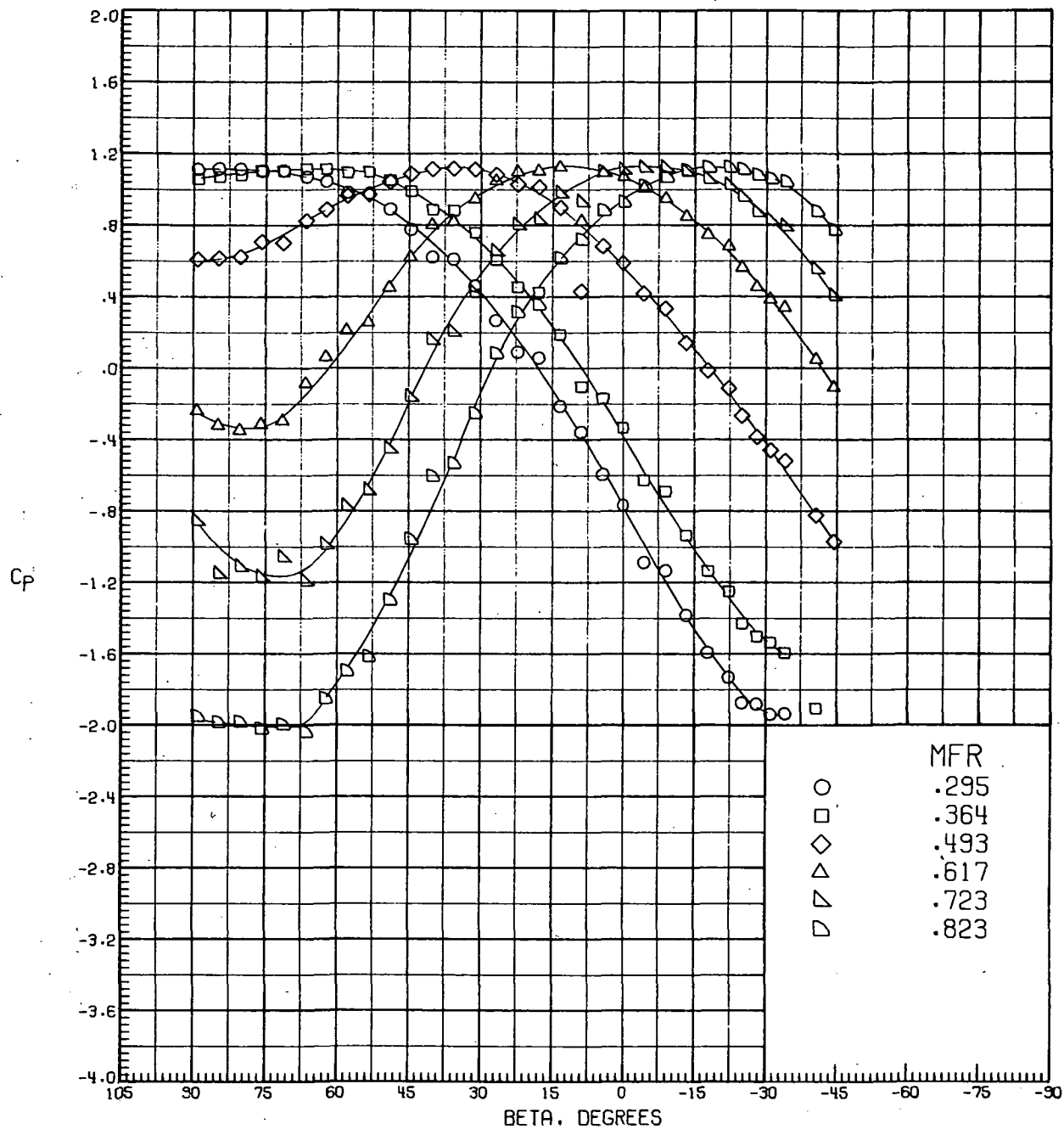
(c) $M = 0.6$; $\alpha = 80^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



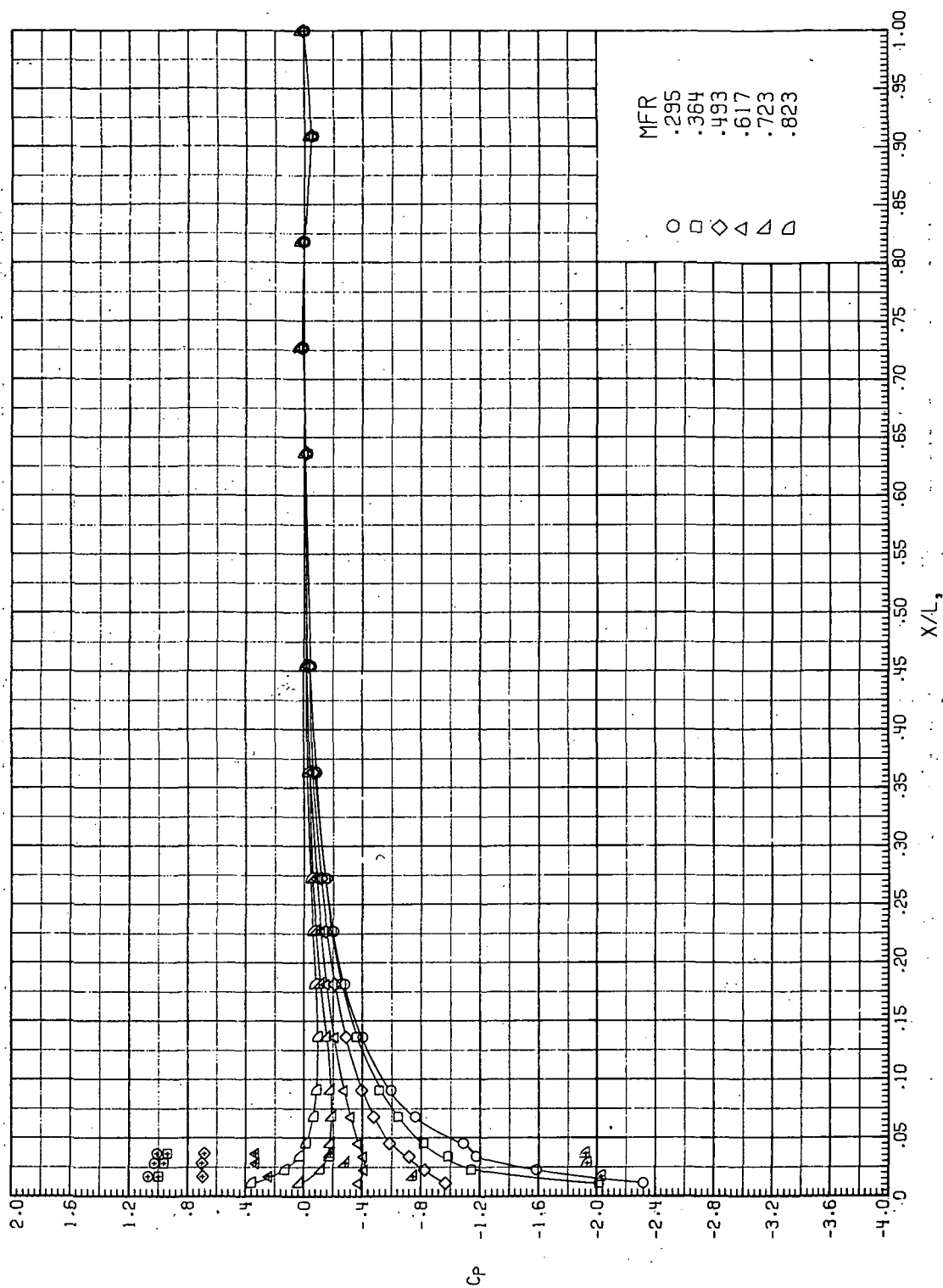
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



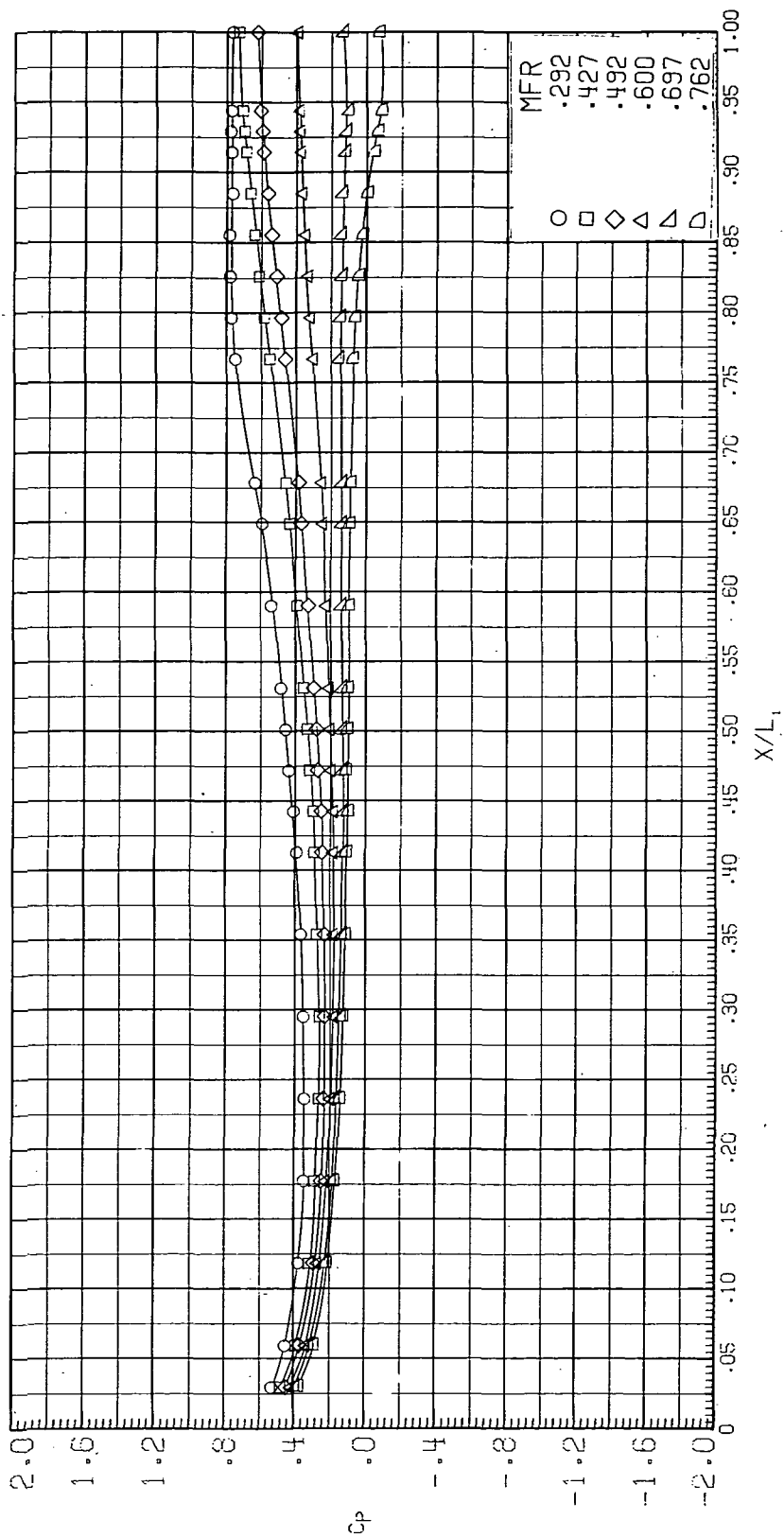
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



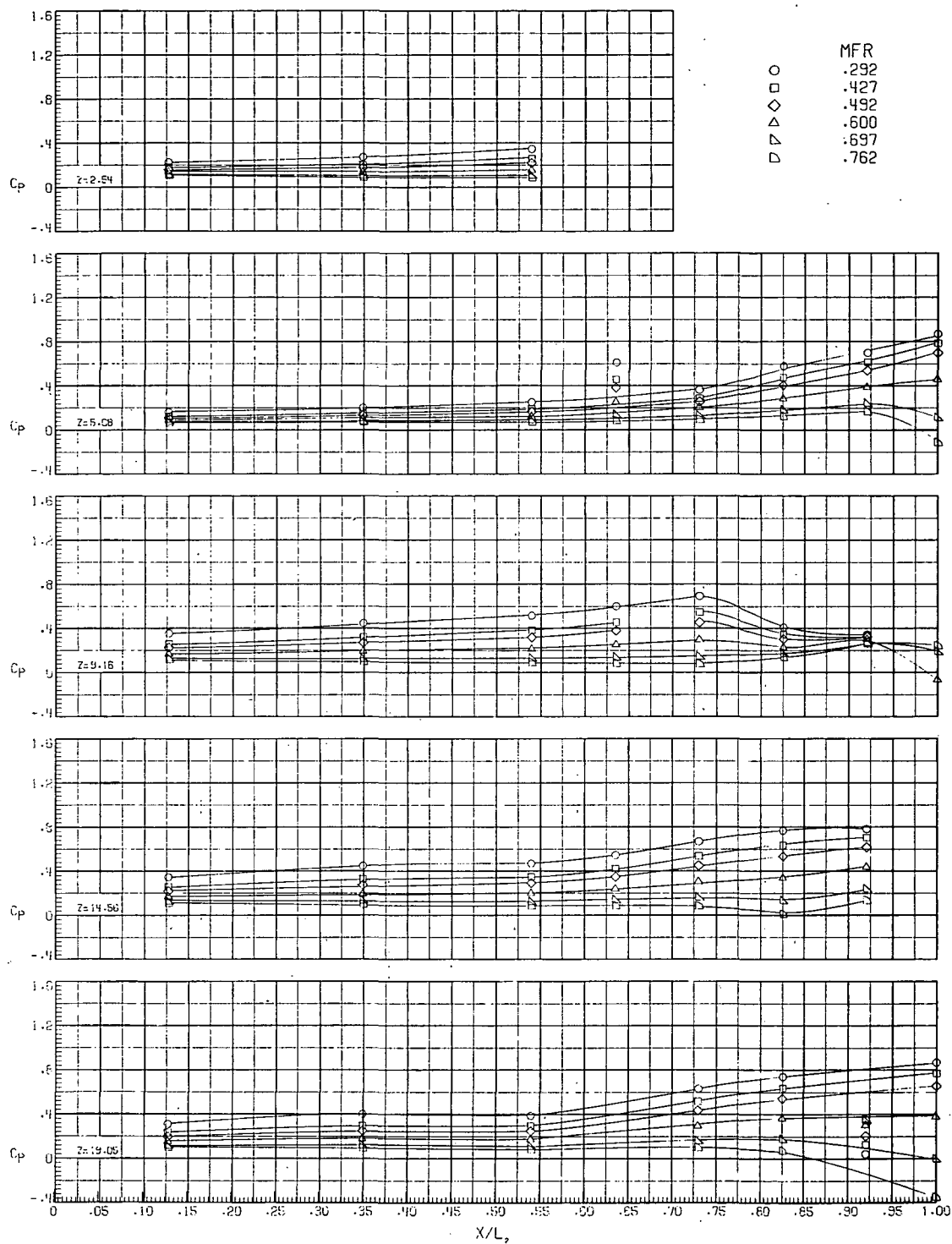
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Continued.



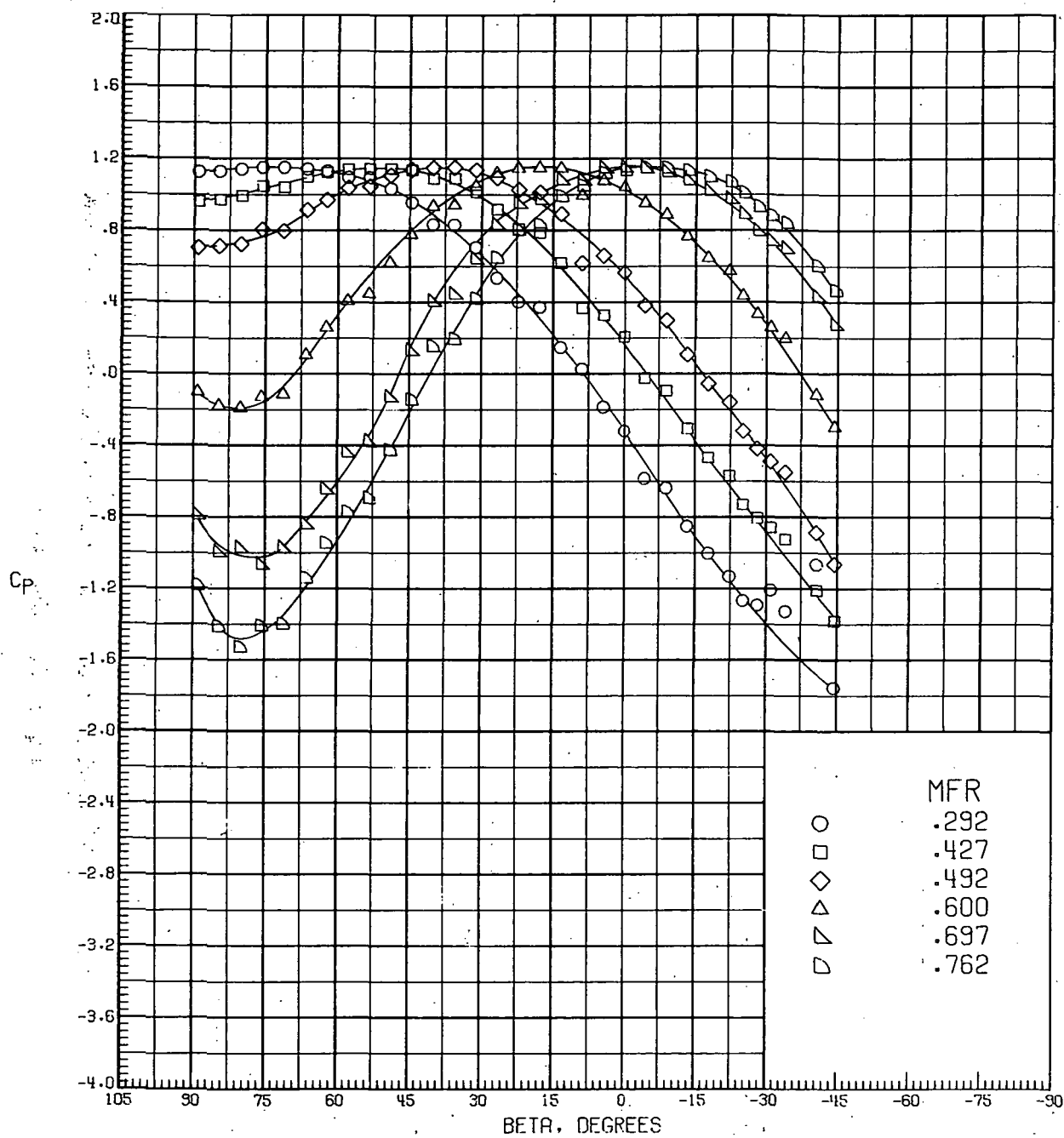
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



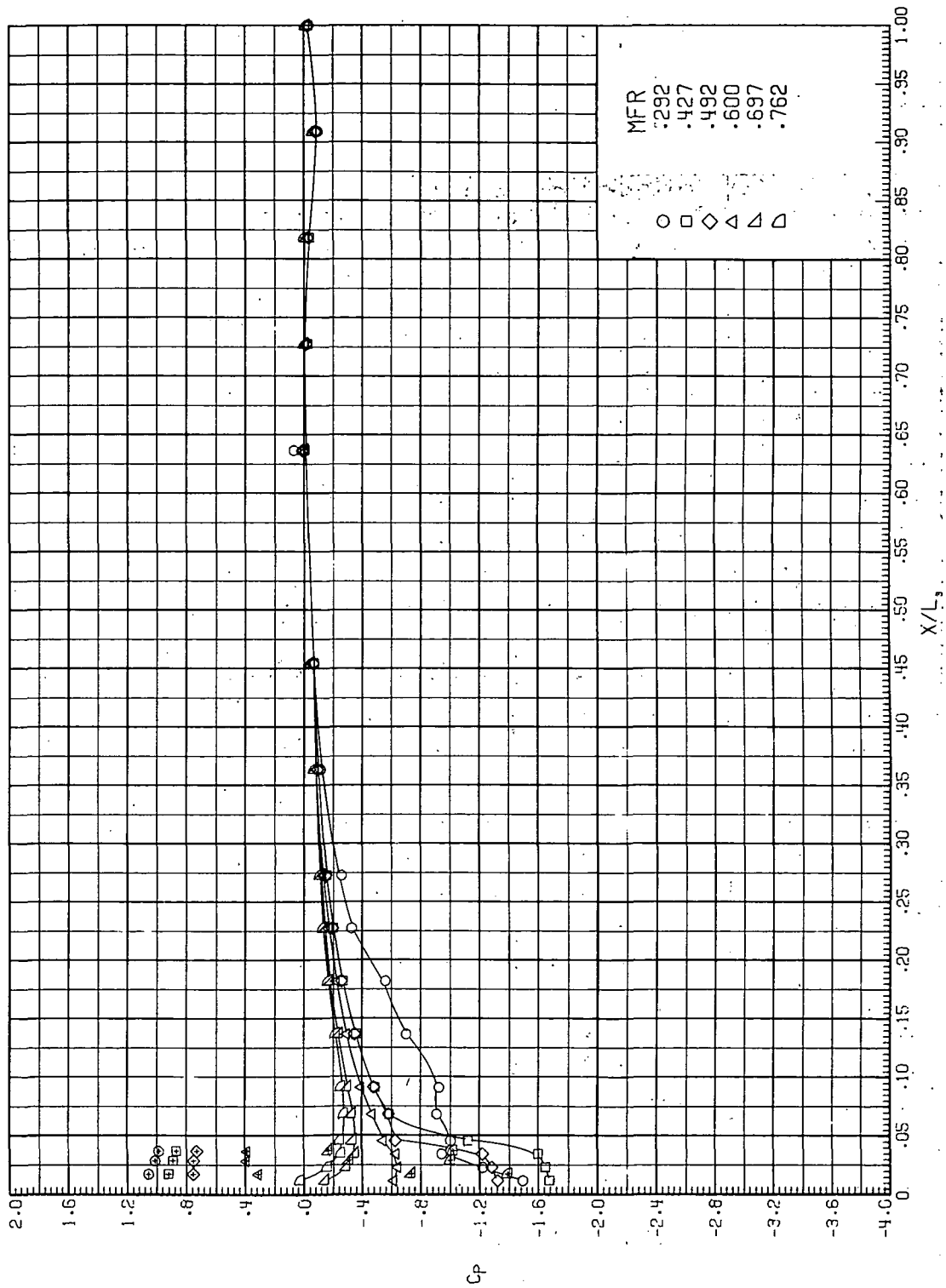
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



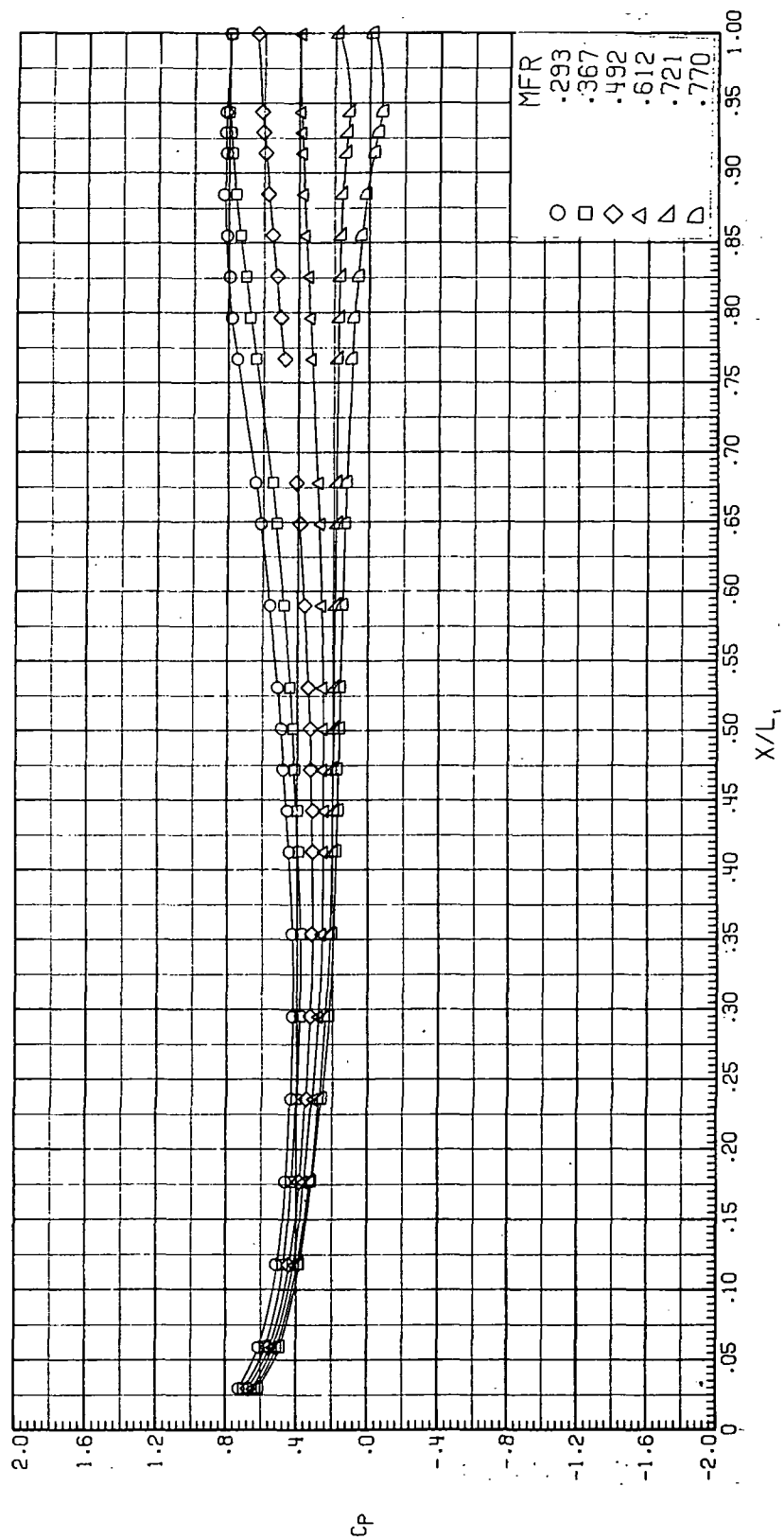
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



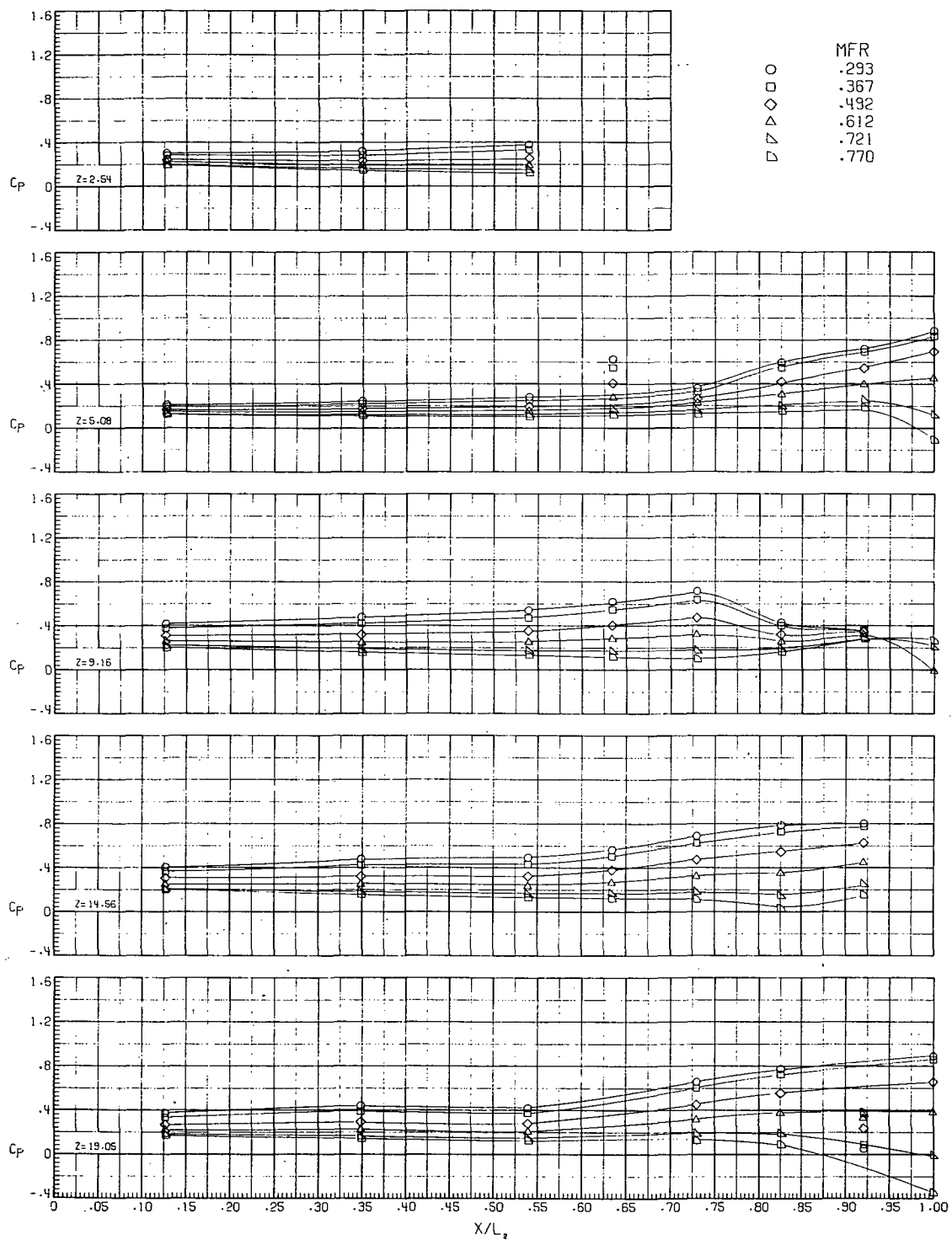
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Continued.



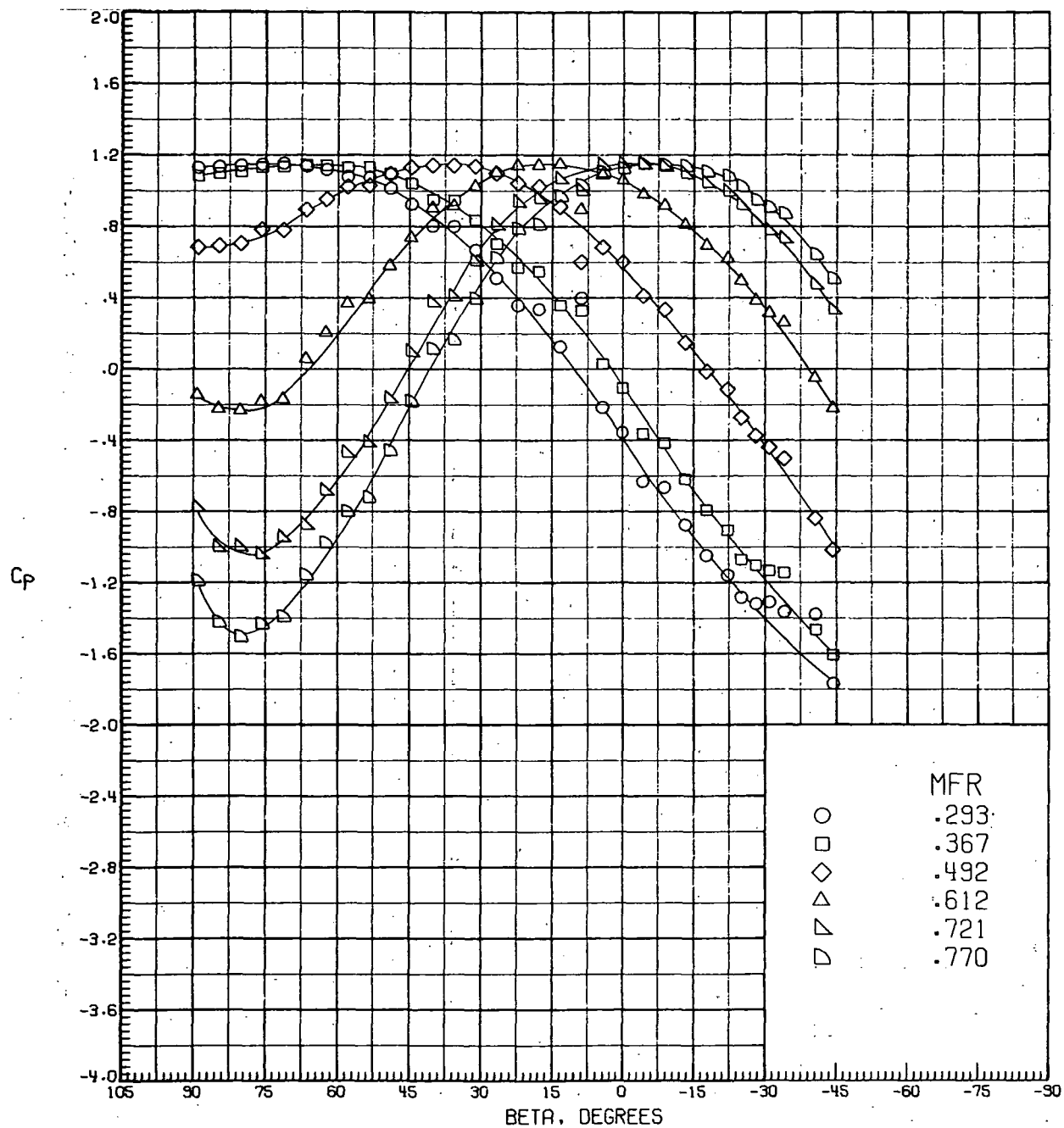
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



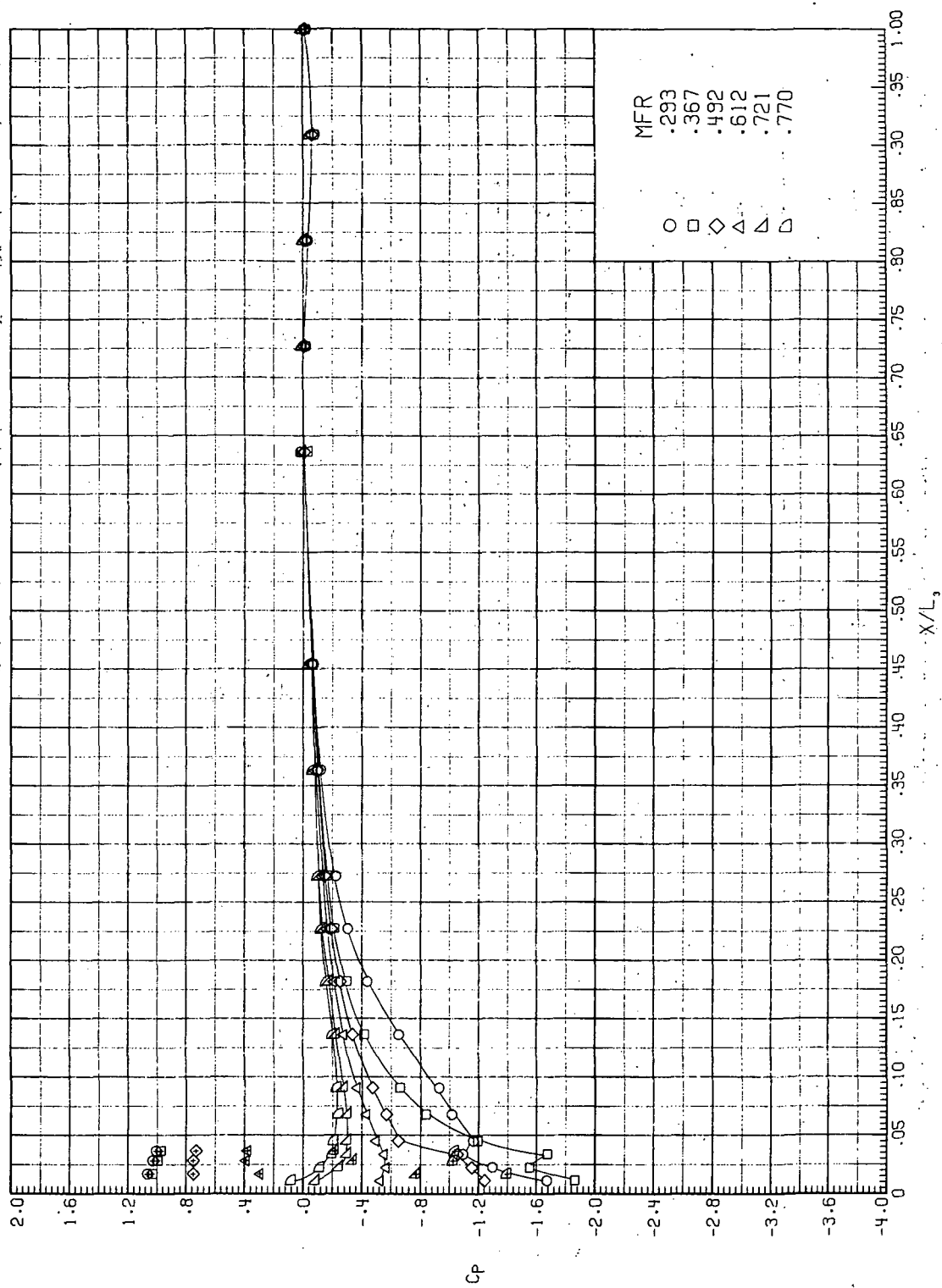
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



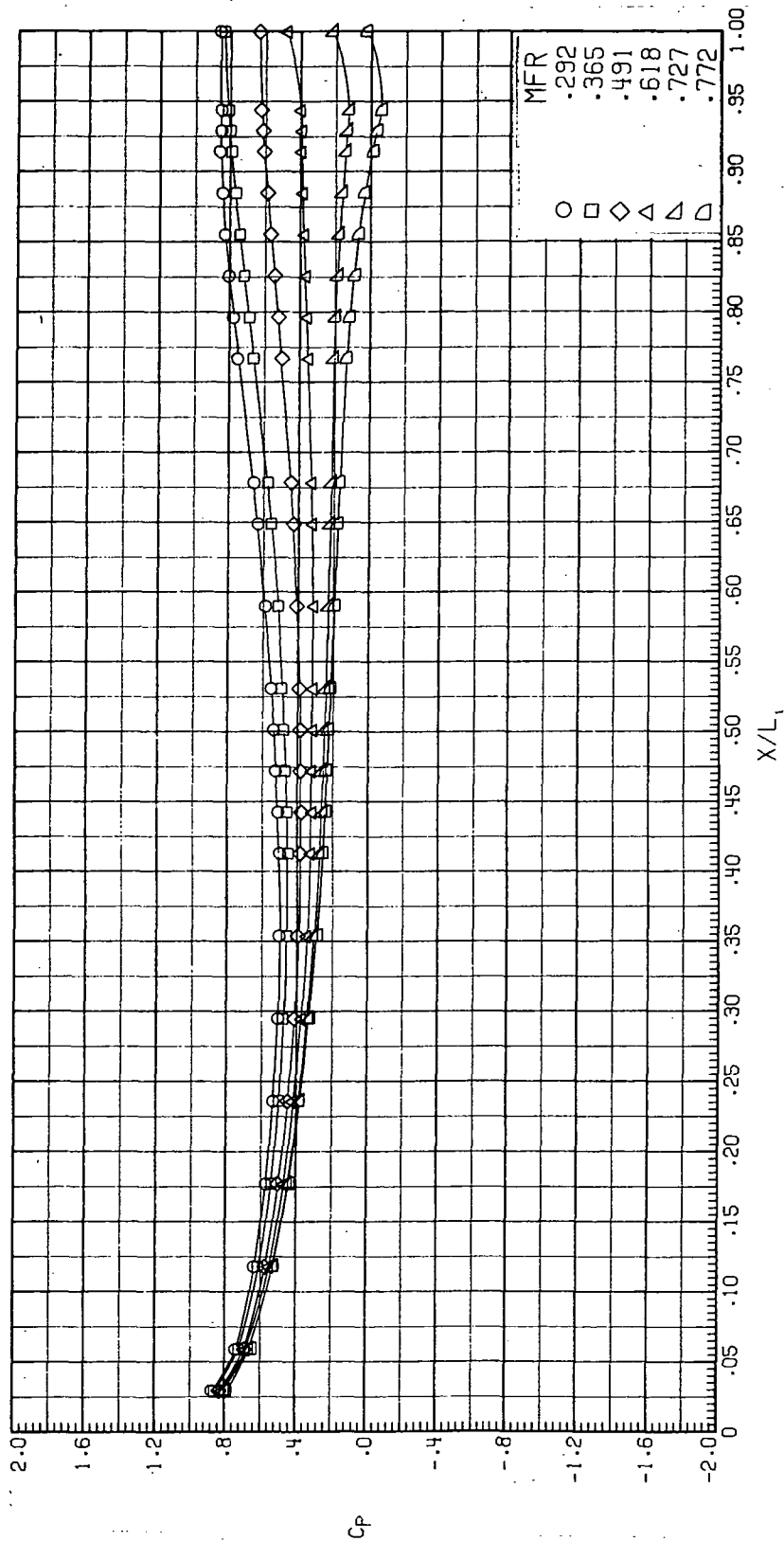
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



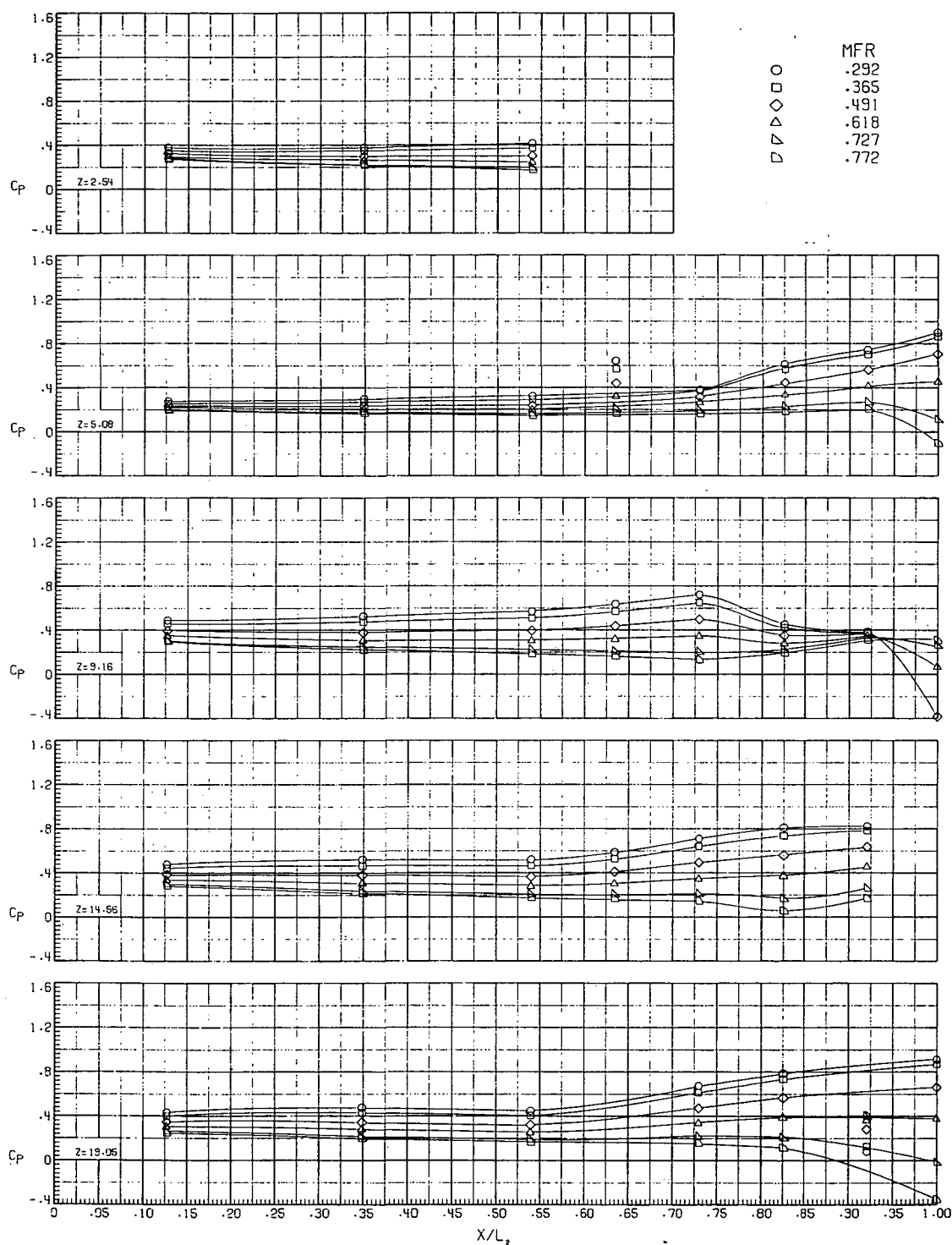
(e) $M = 0.7$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Continued.



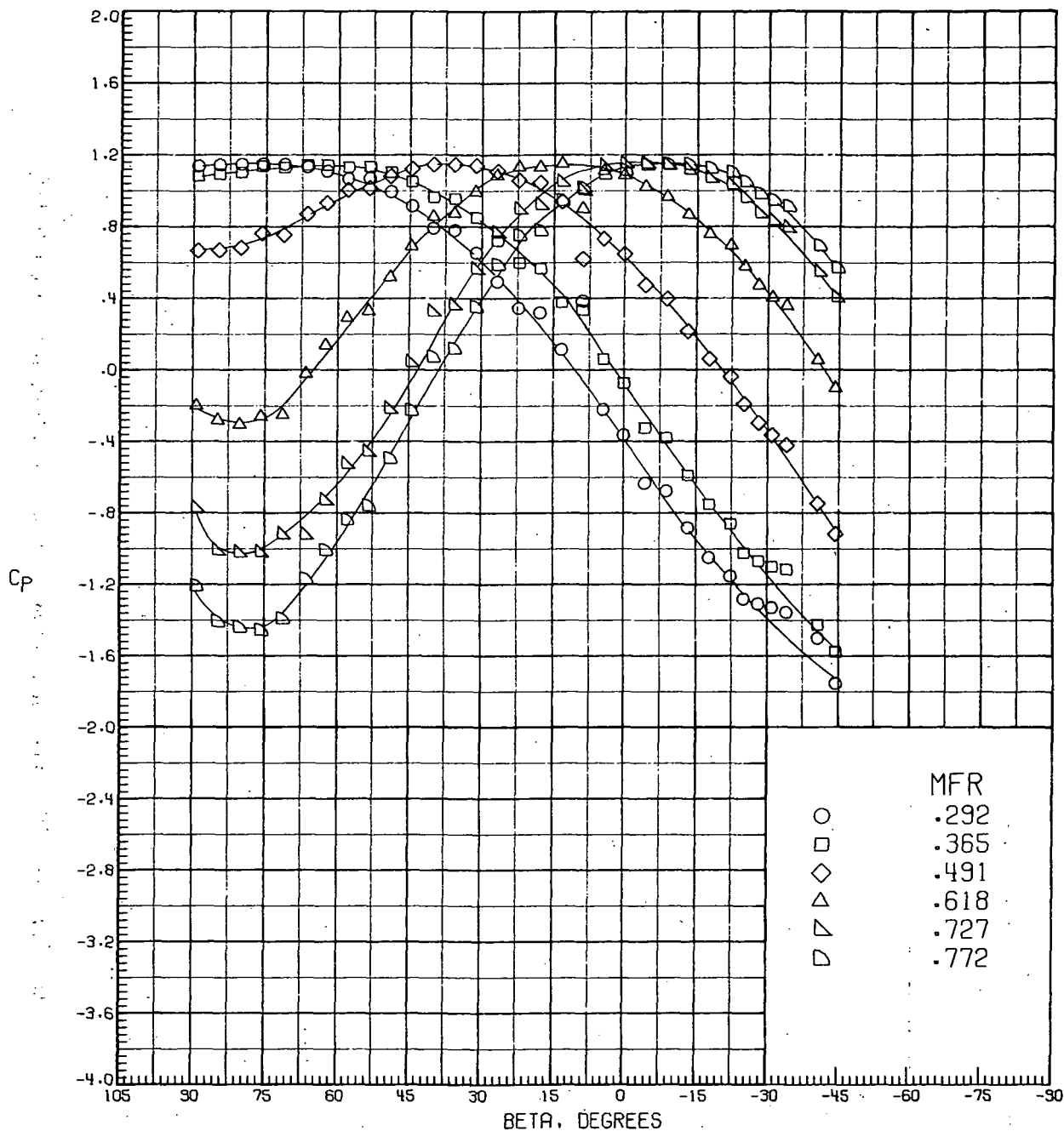
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



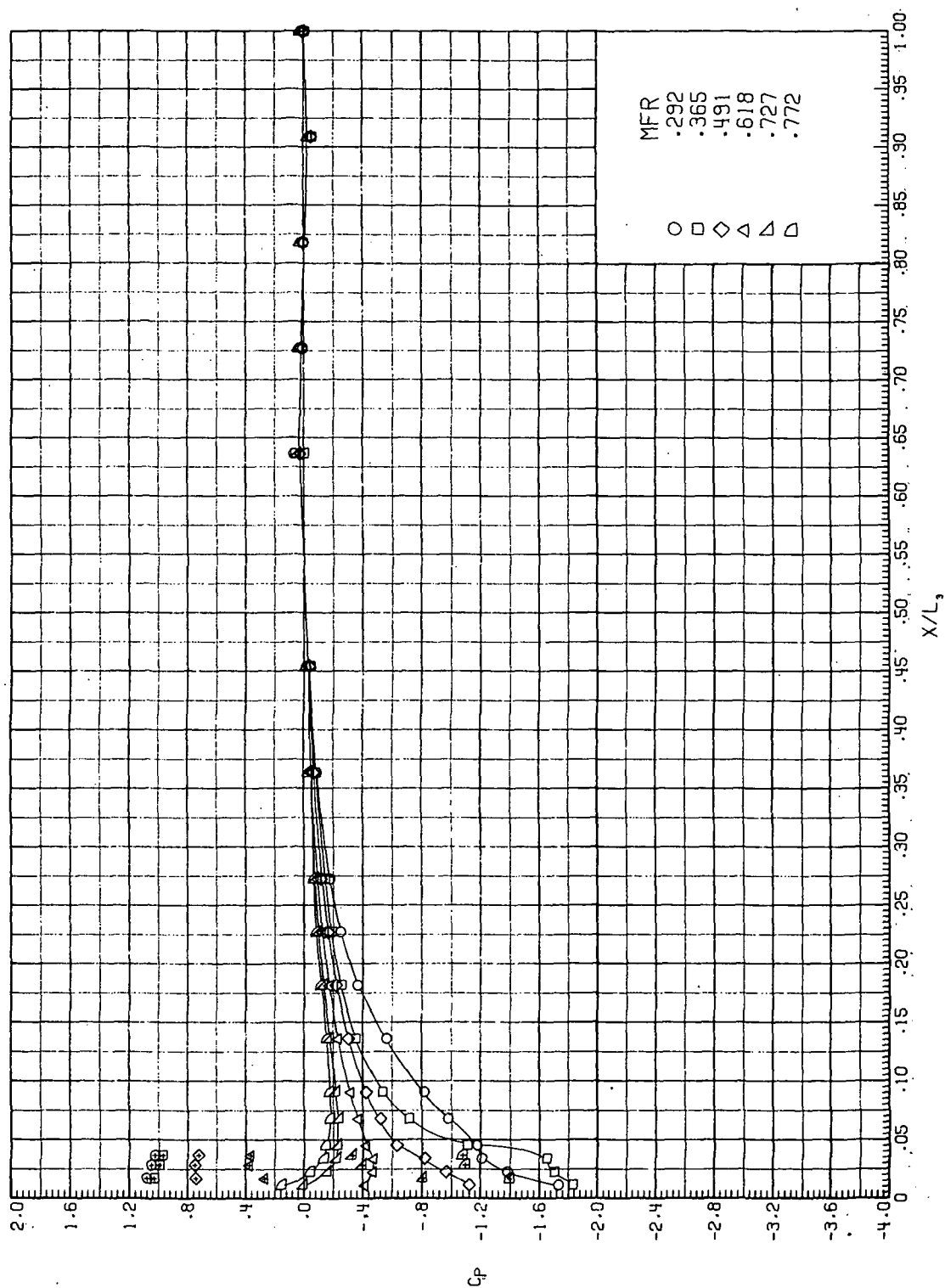
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



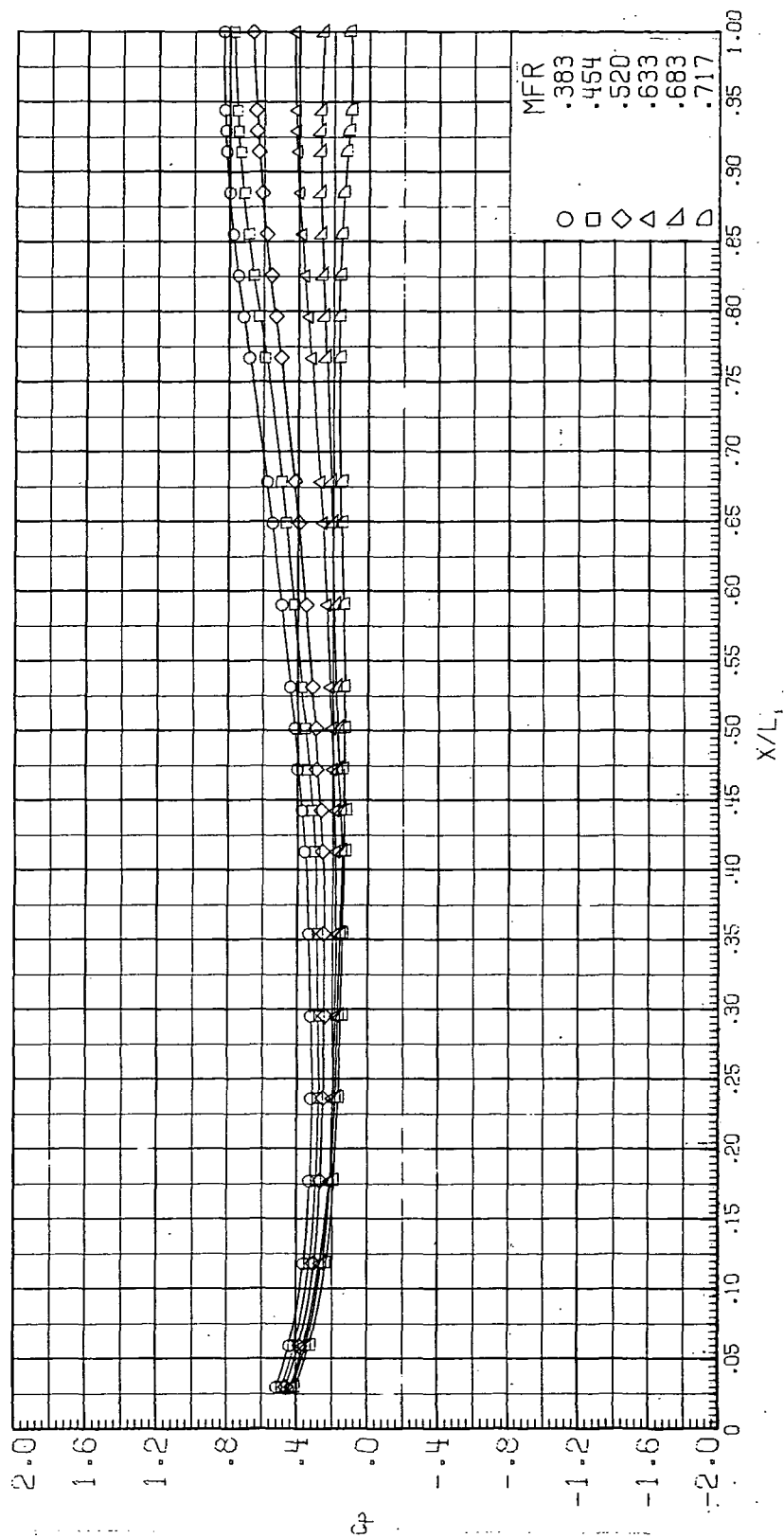
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



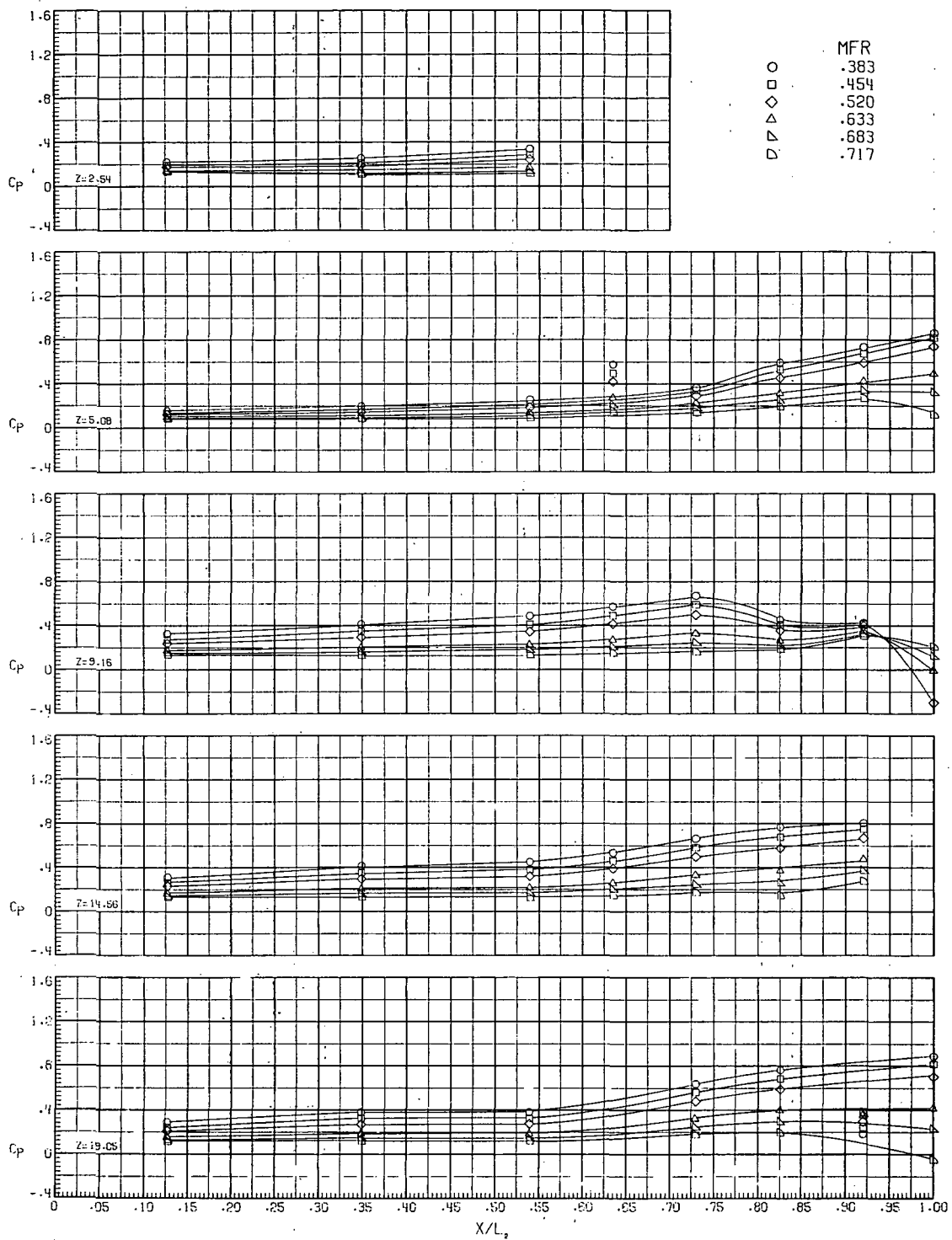
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Continued.



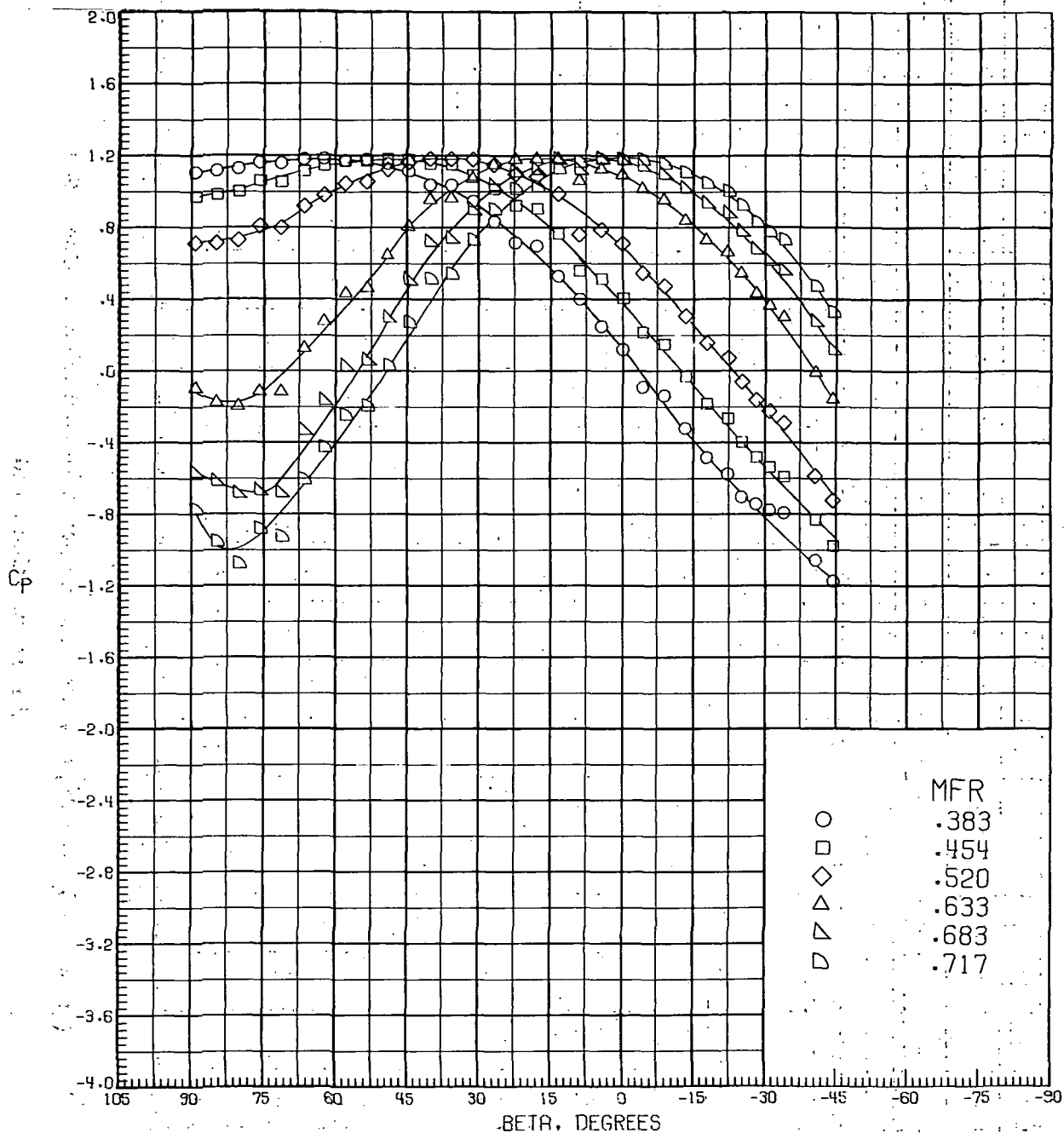
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



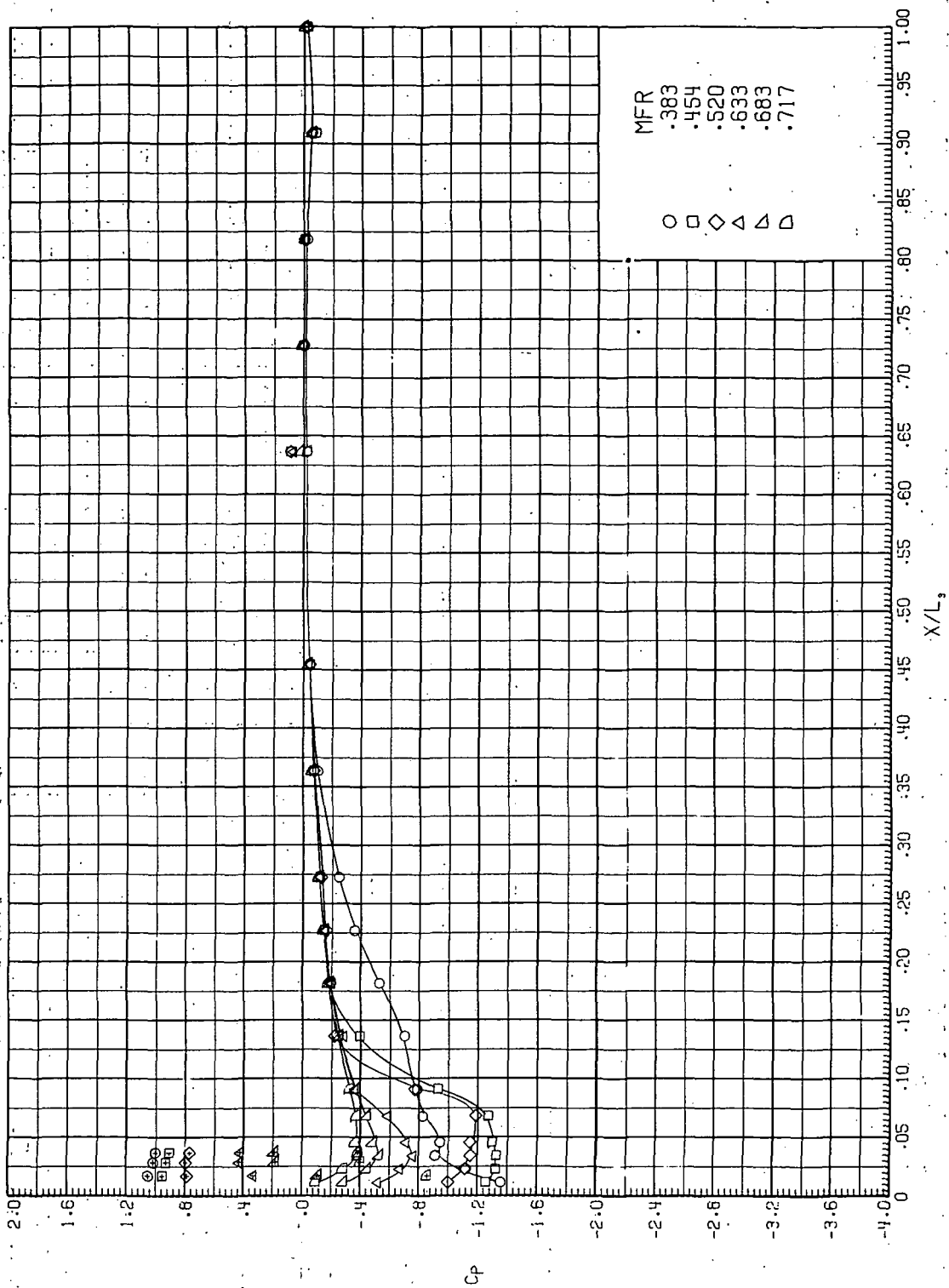
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



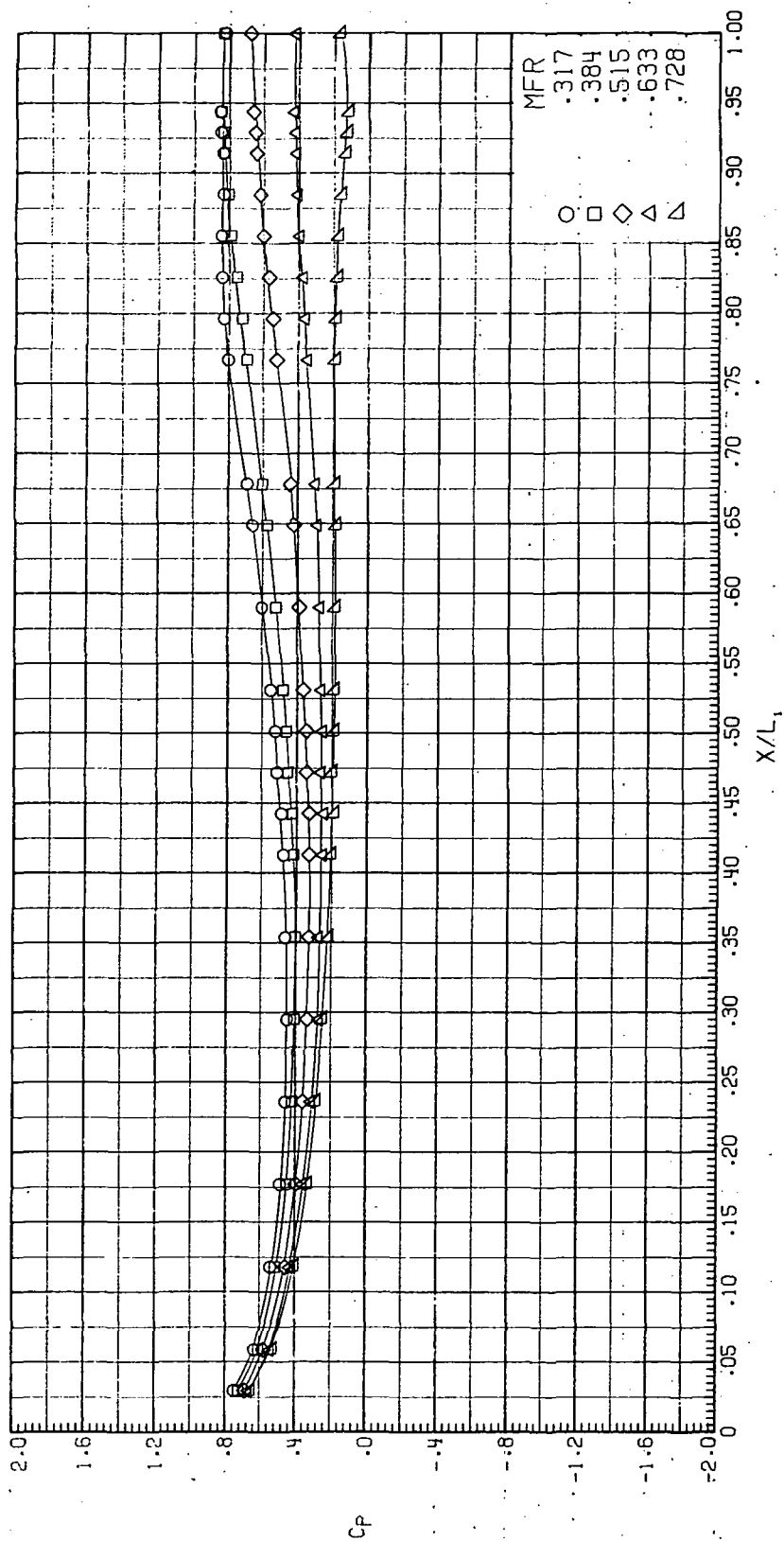
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



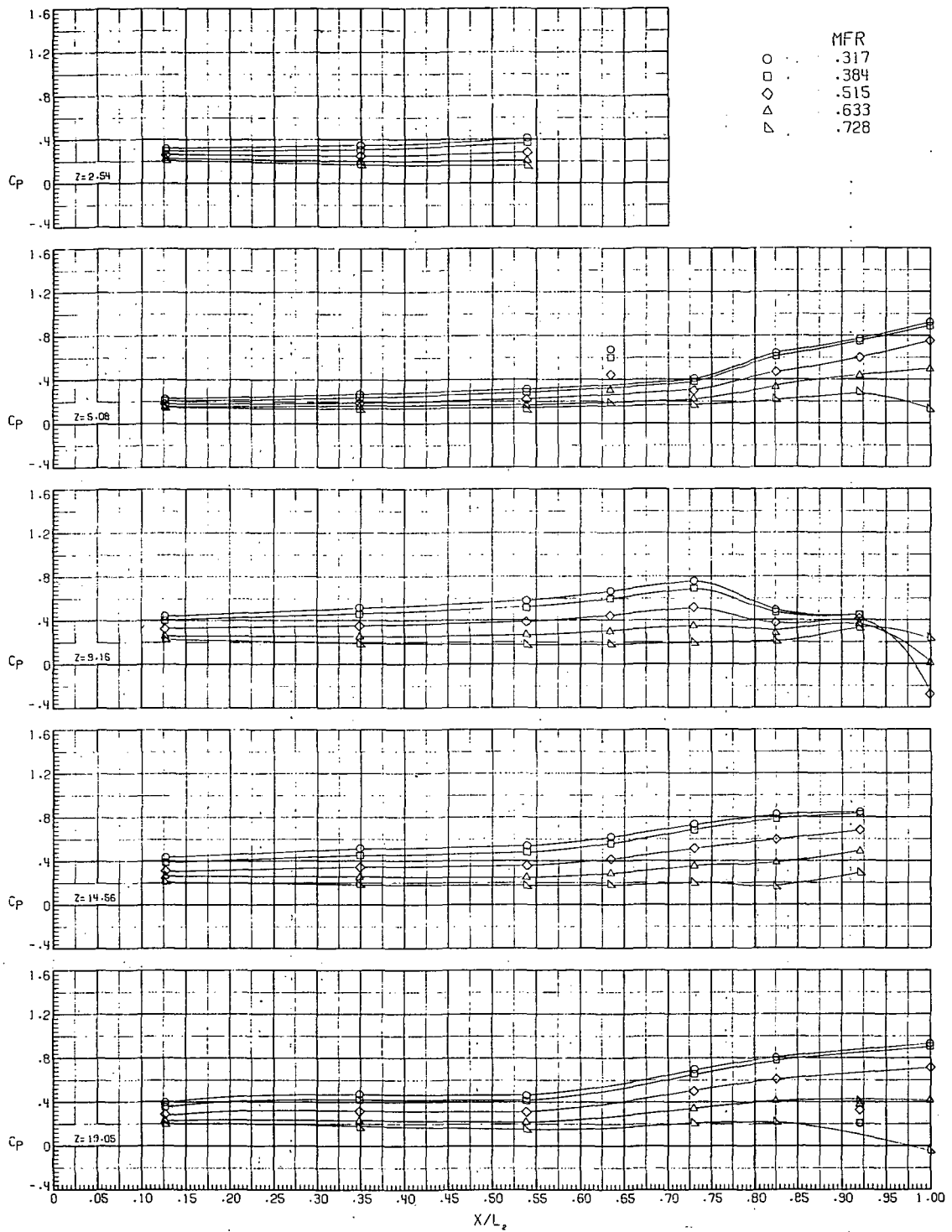
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Continued.



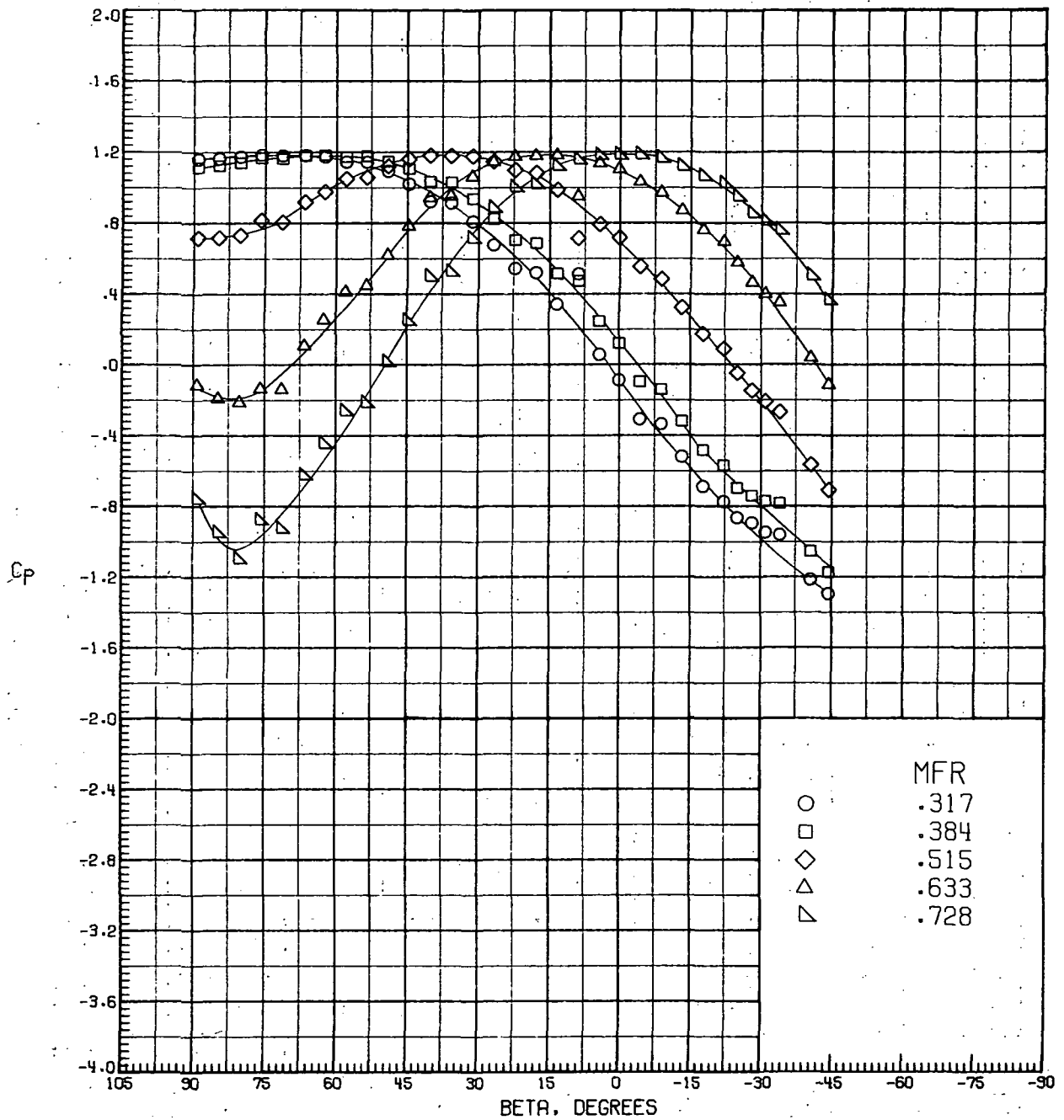
(h) $M = 0.8$; $\alpha = 40^\circ$; ramp pressure coefficients.

Figure 30.- Continued.



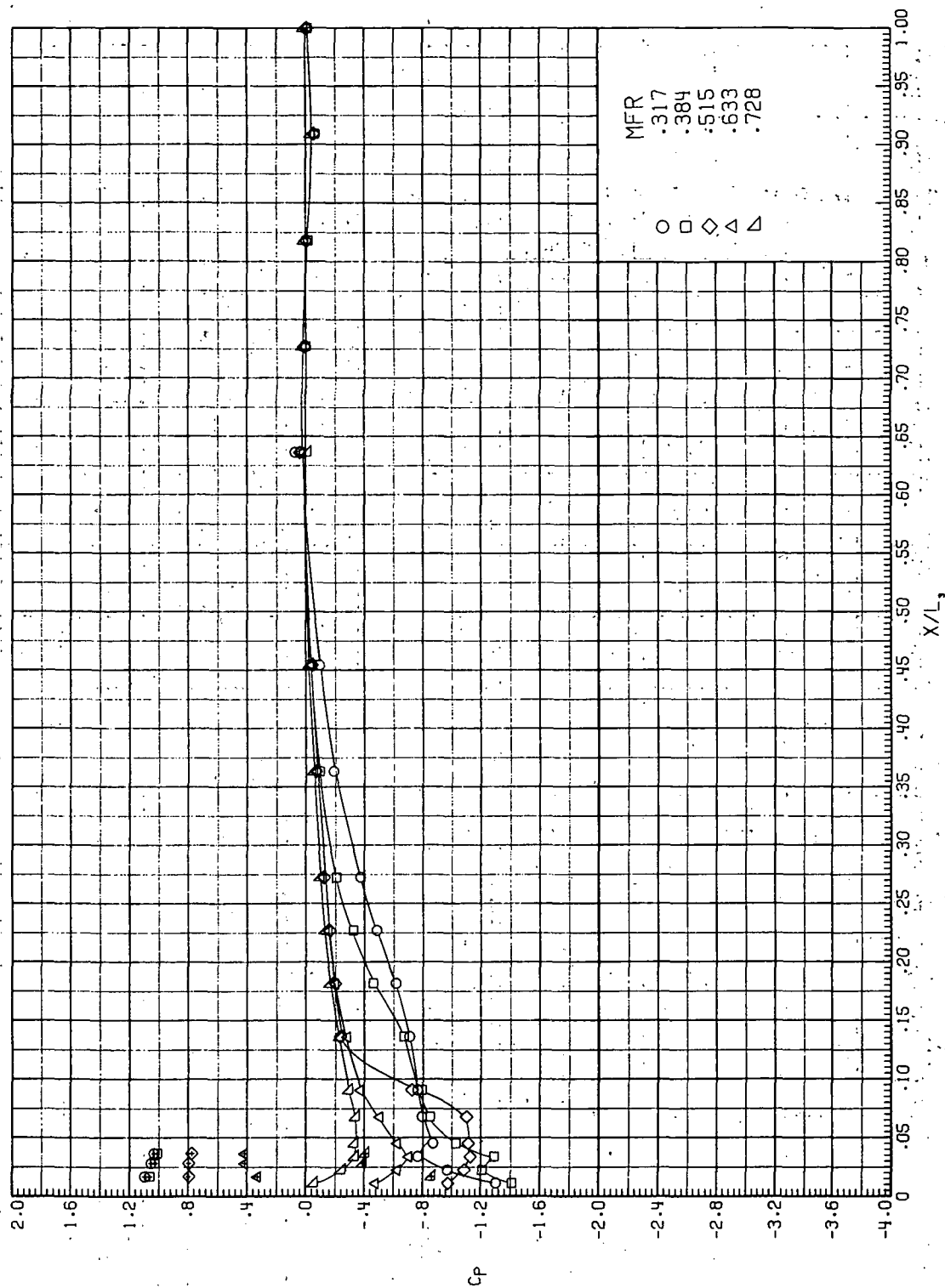
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



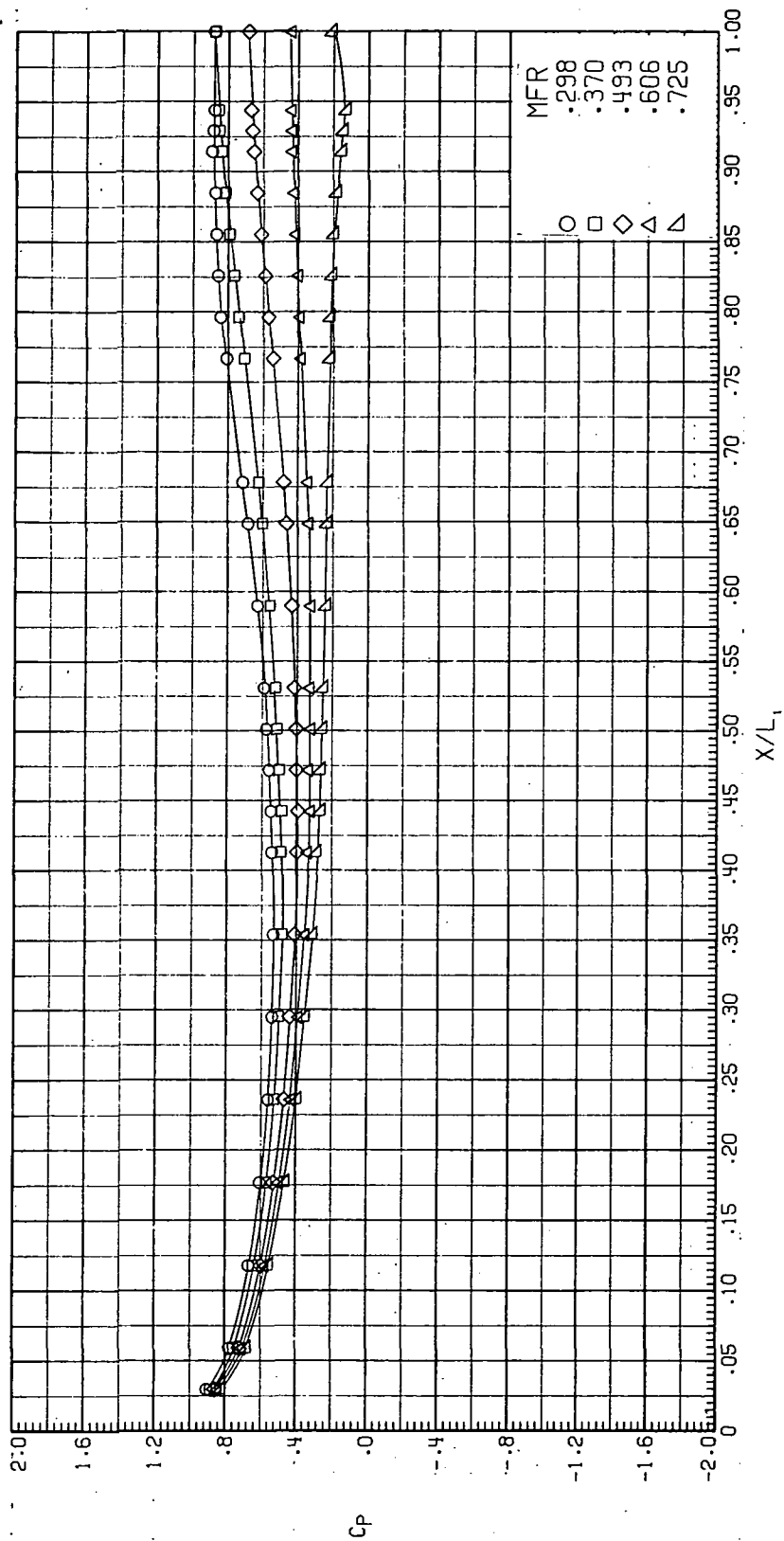
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



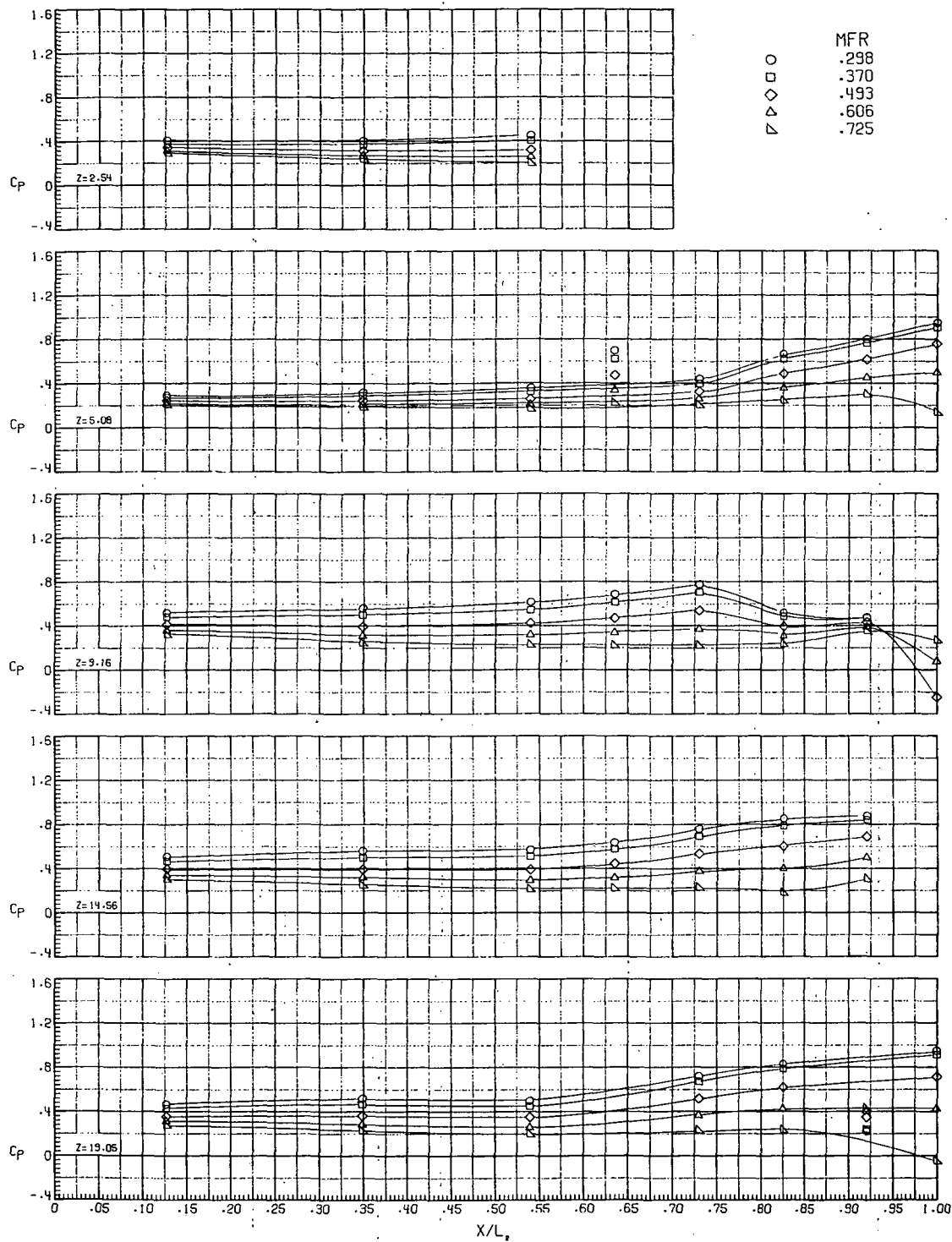
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30. - Continued.



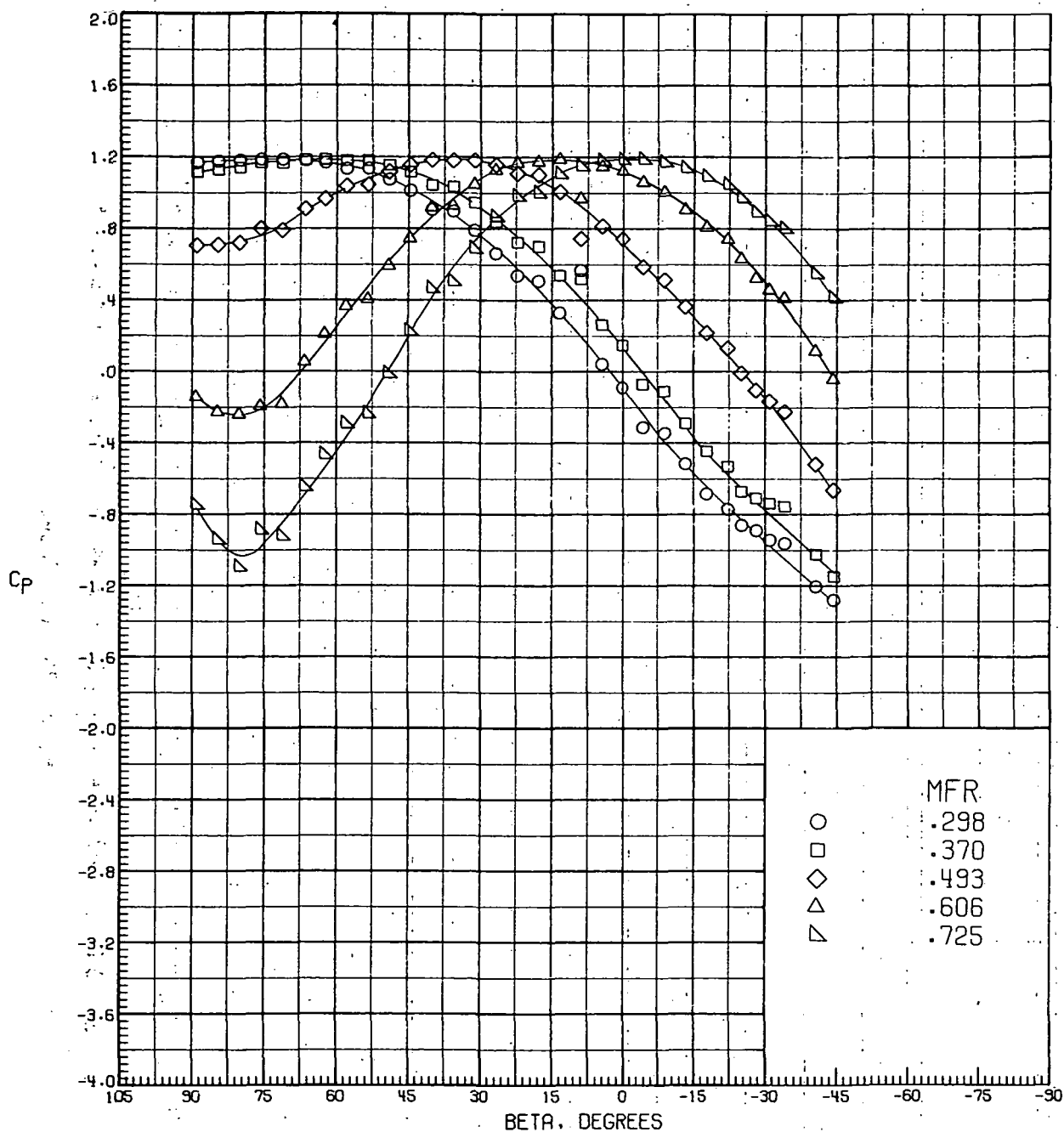
(i) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 30. - Continued.



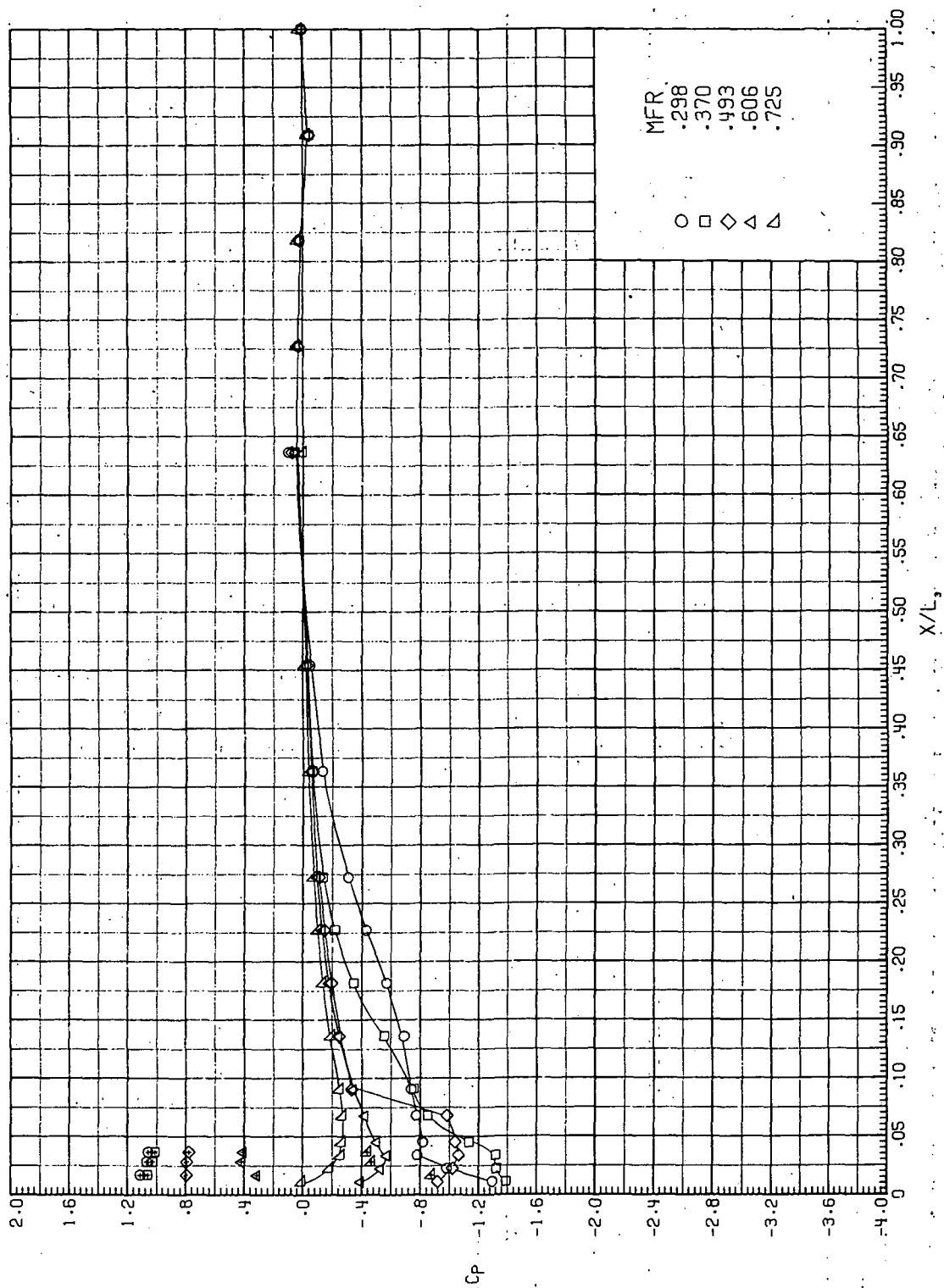
(i) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 30.- Continued.



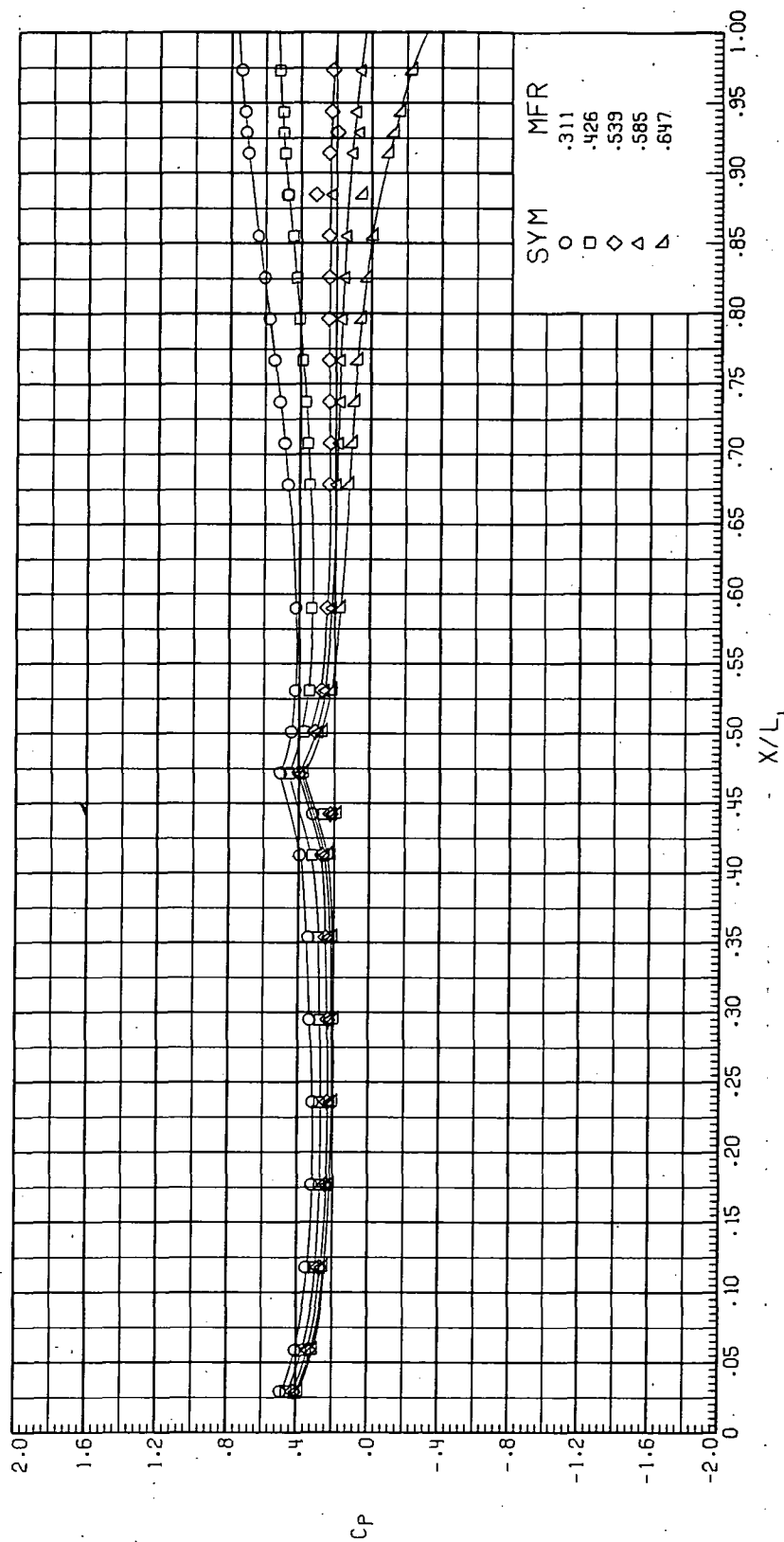
(i) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 30.- Continued.



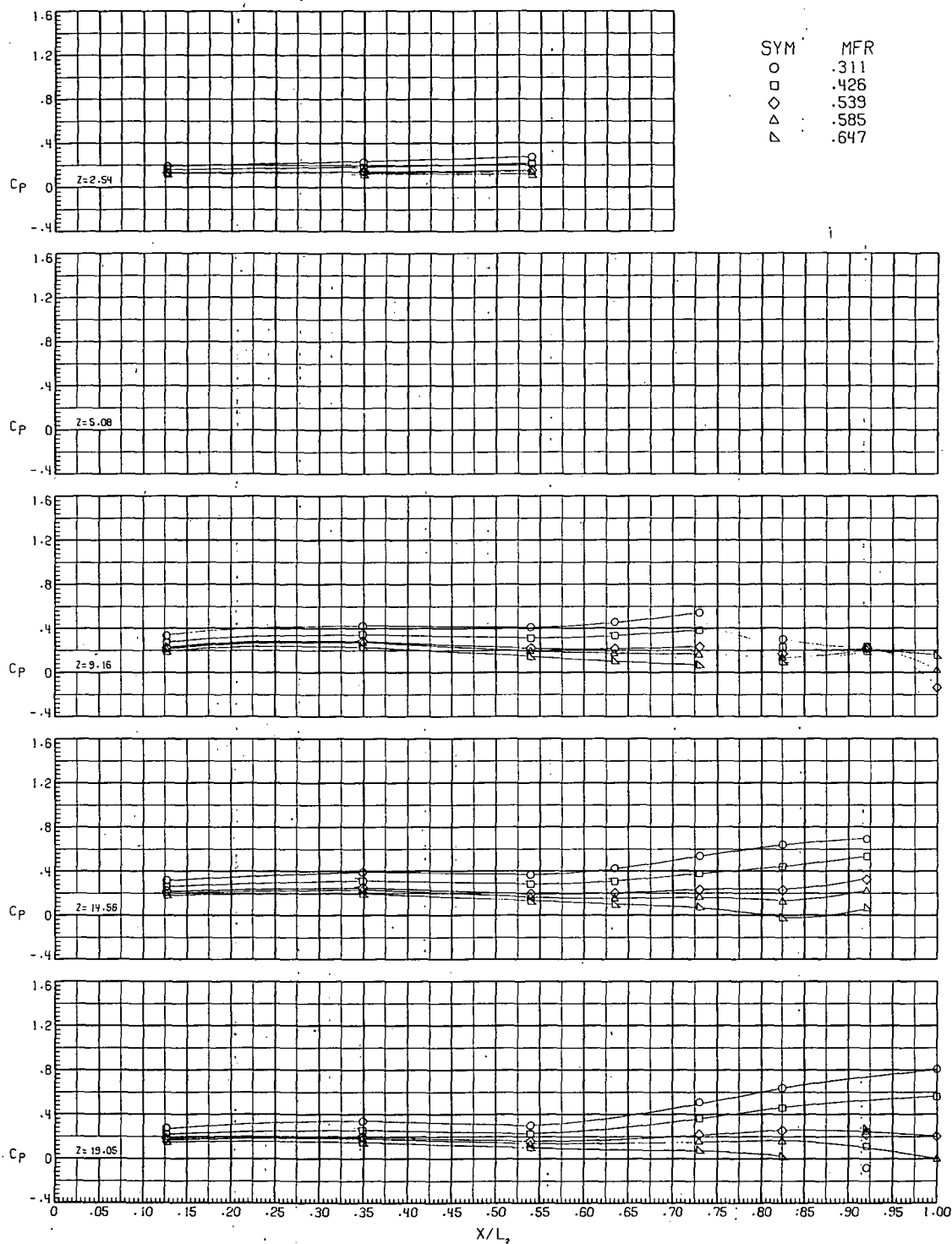
(i) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 30.- Concluded.



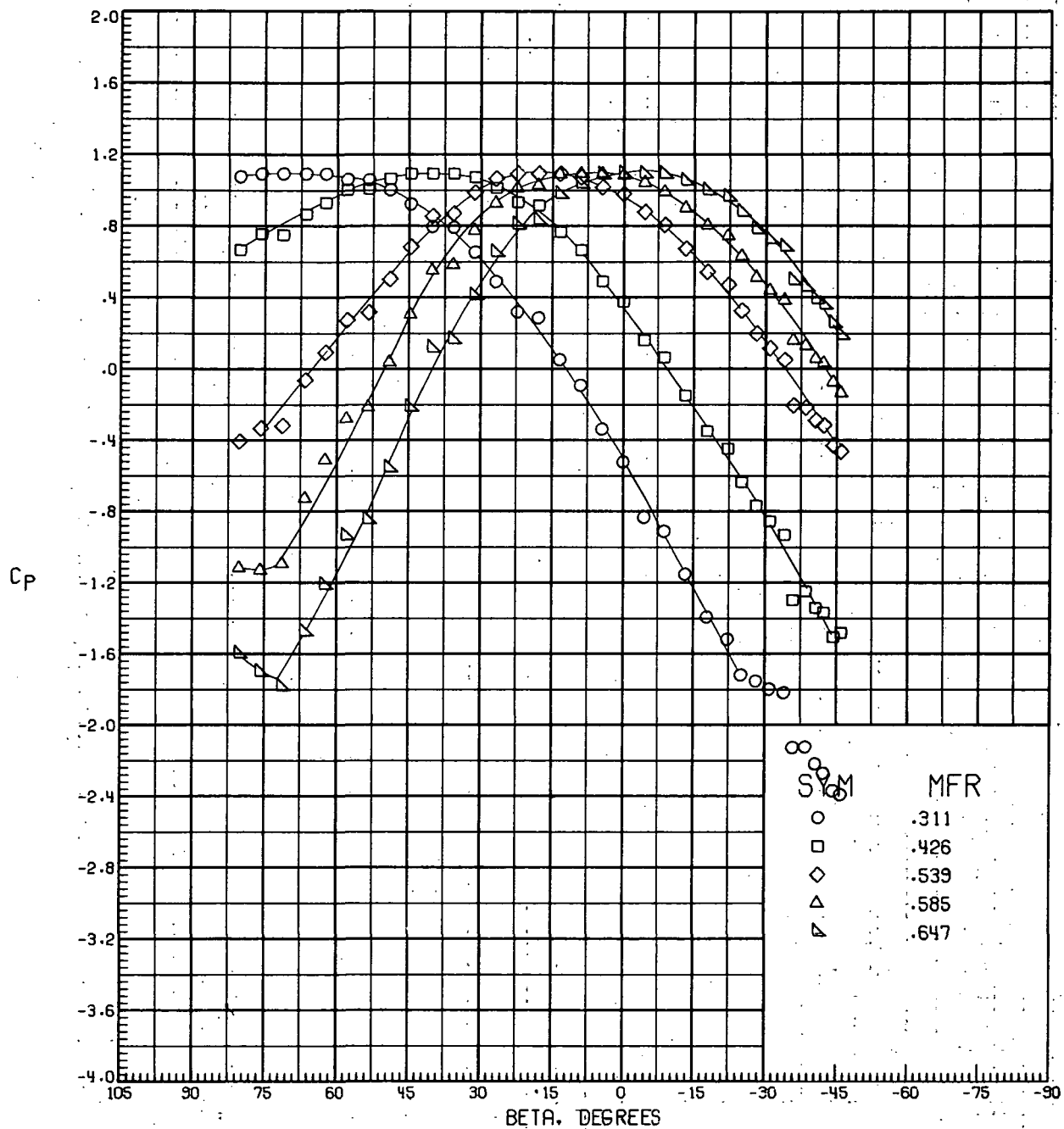
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 31.- Pressure coefficients for cowl 90-3. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



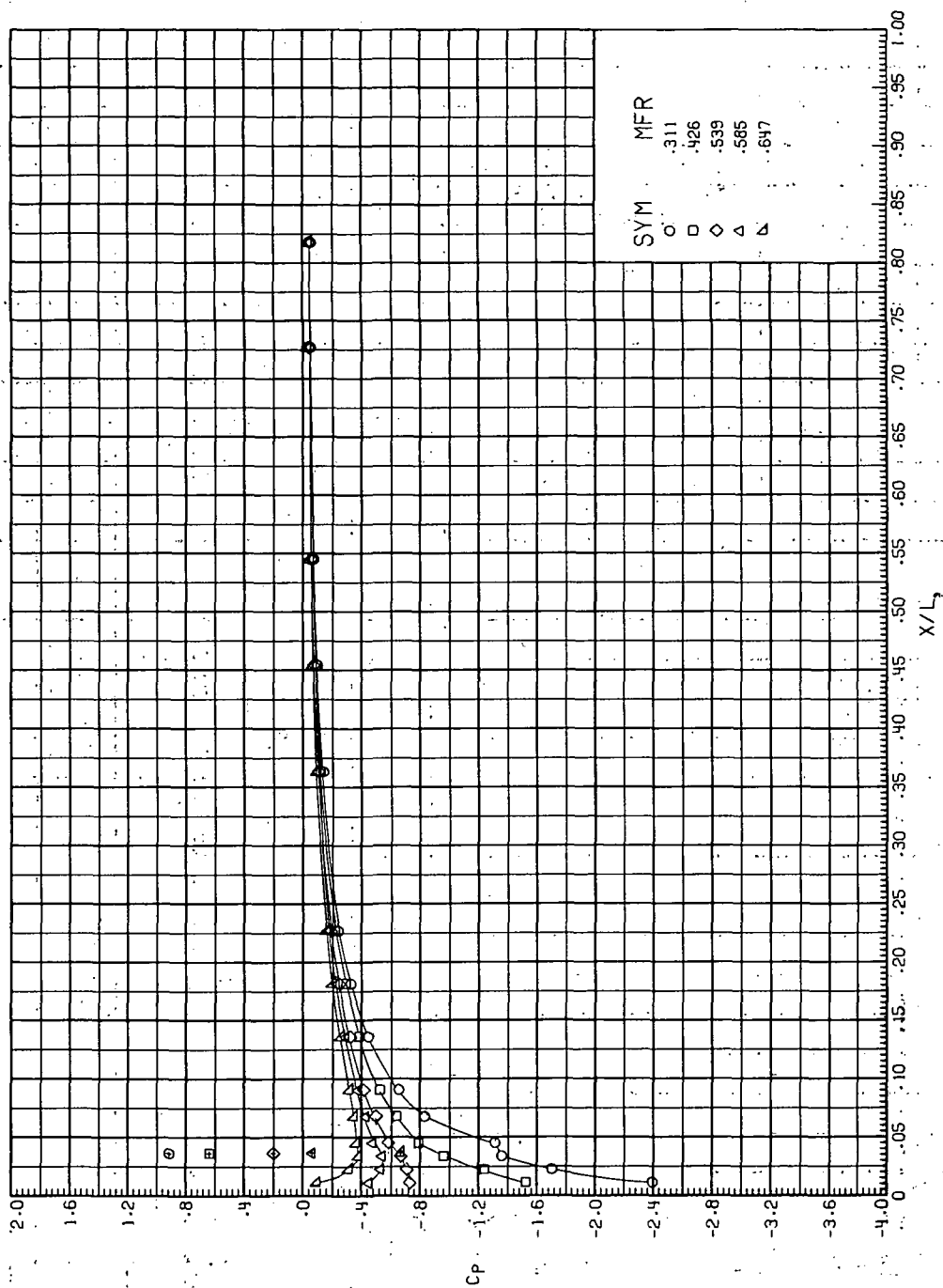
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



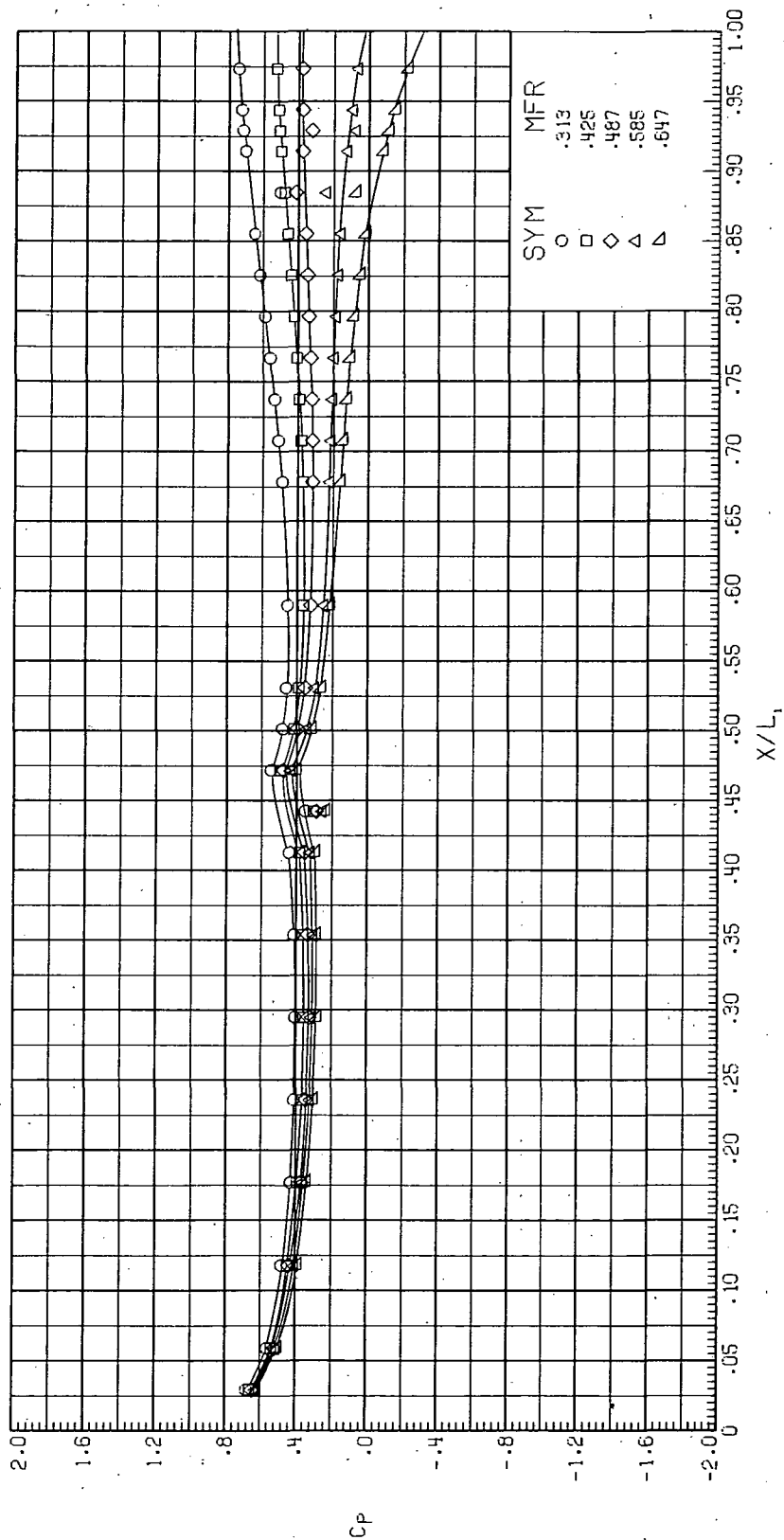
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



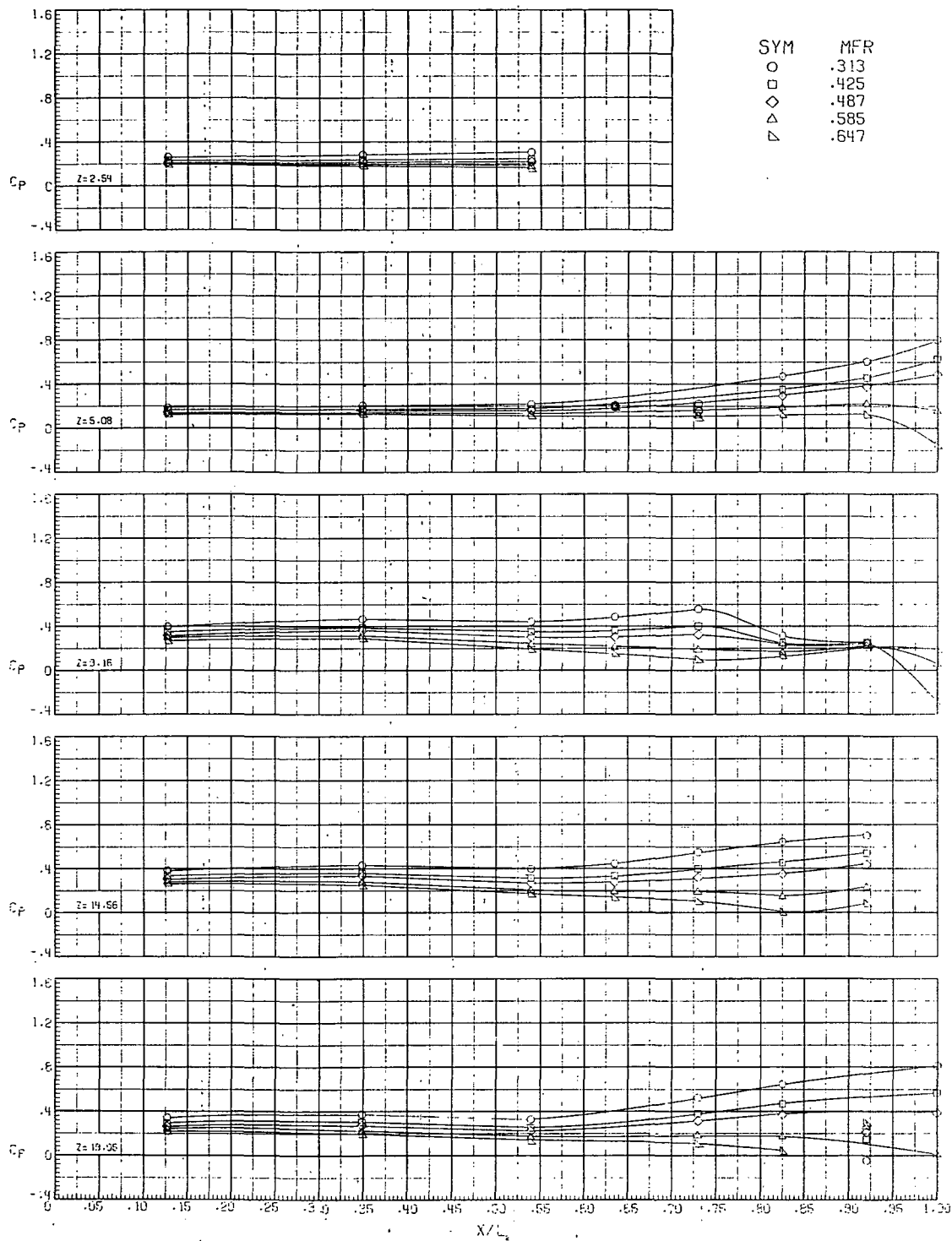
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31. - Continued.



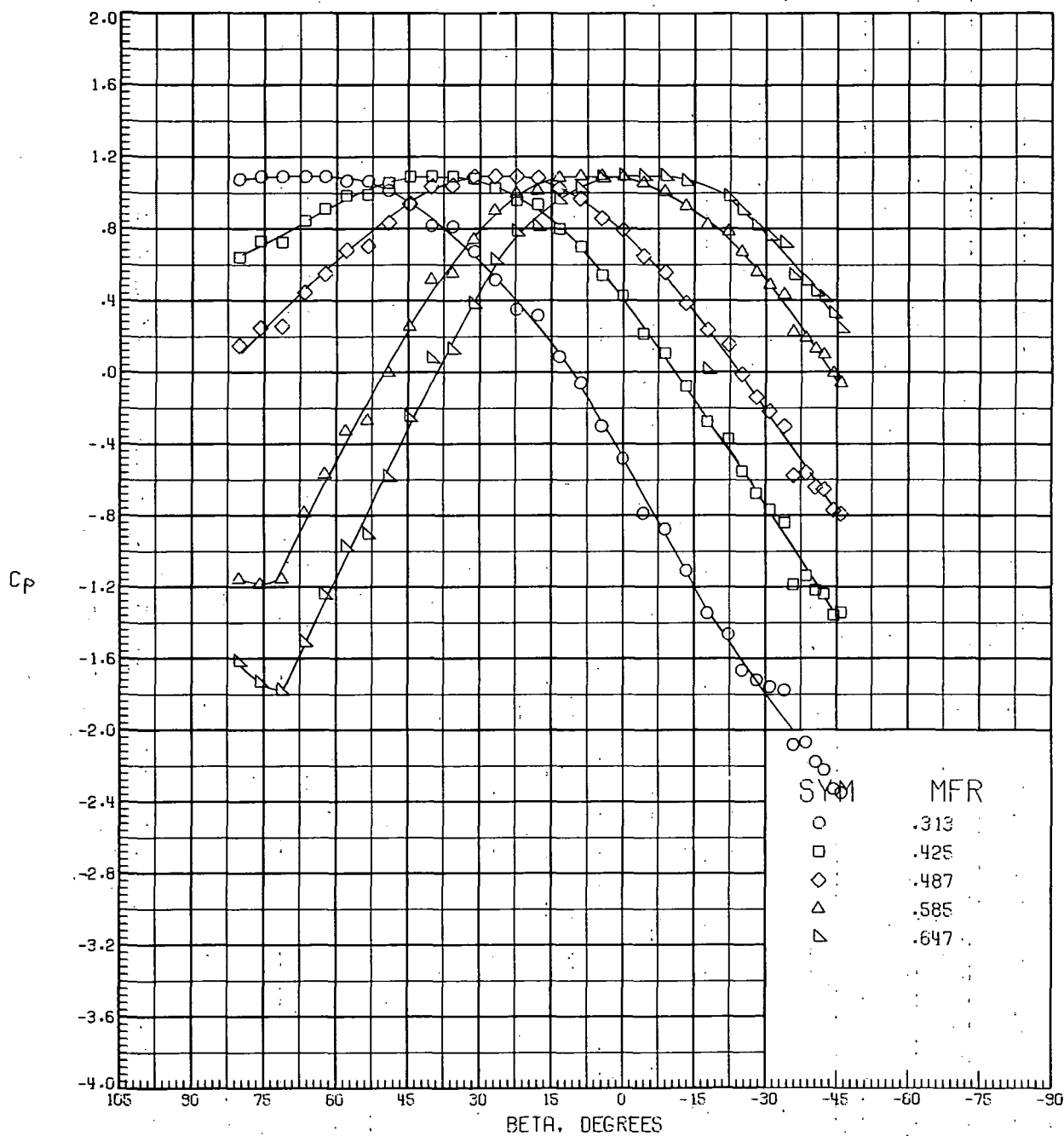
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



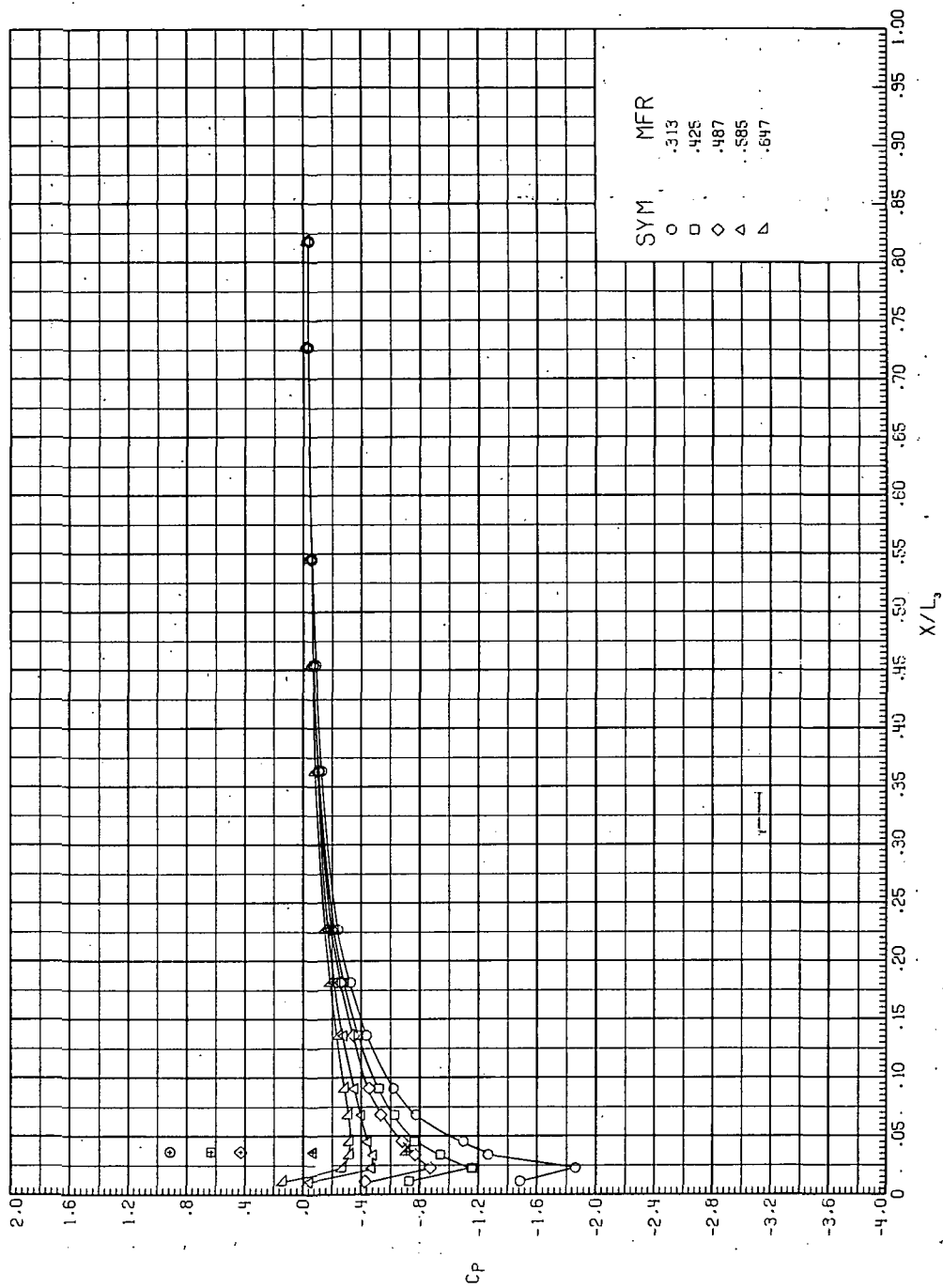
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



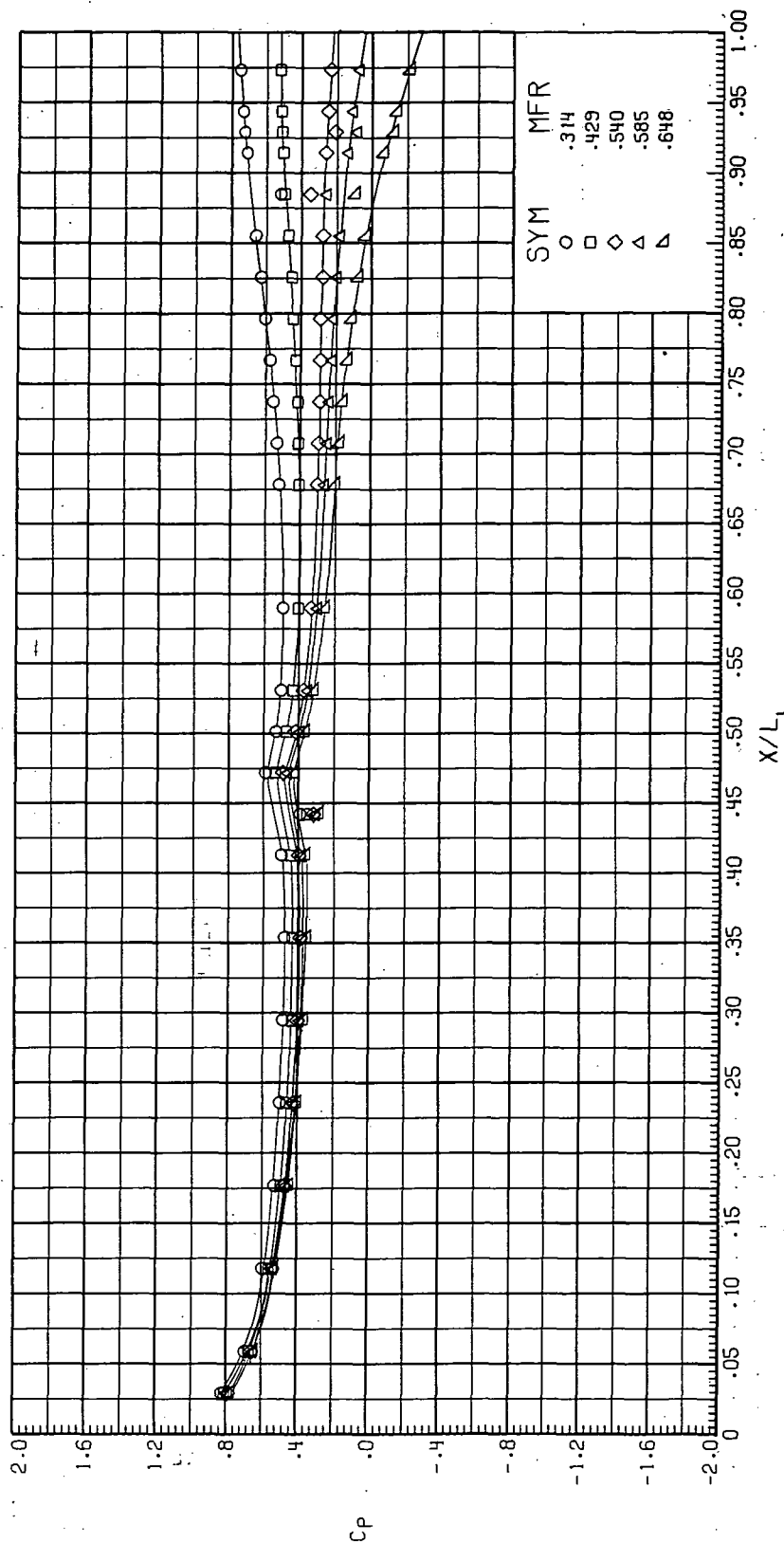
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



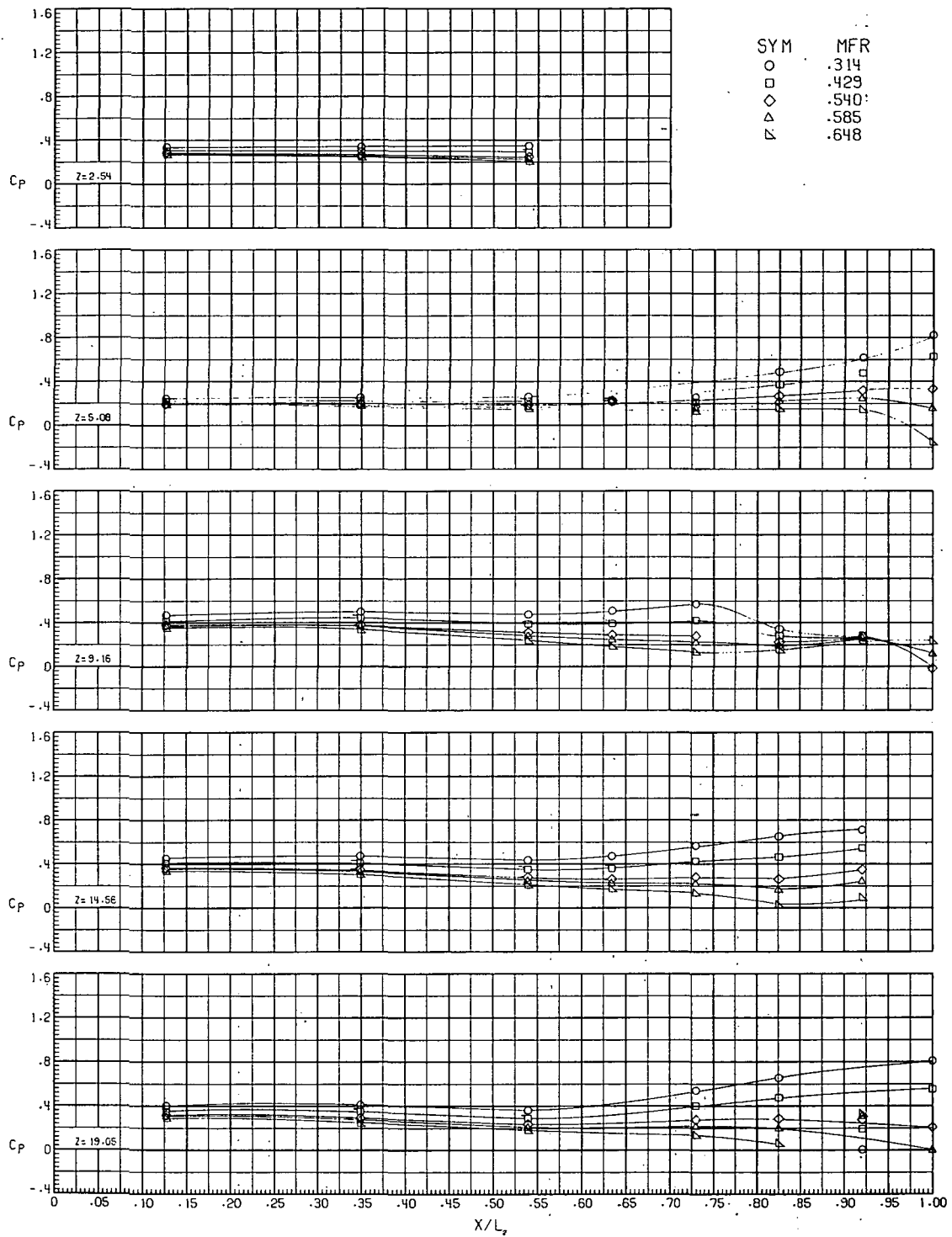
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



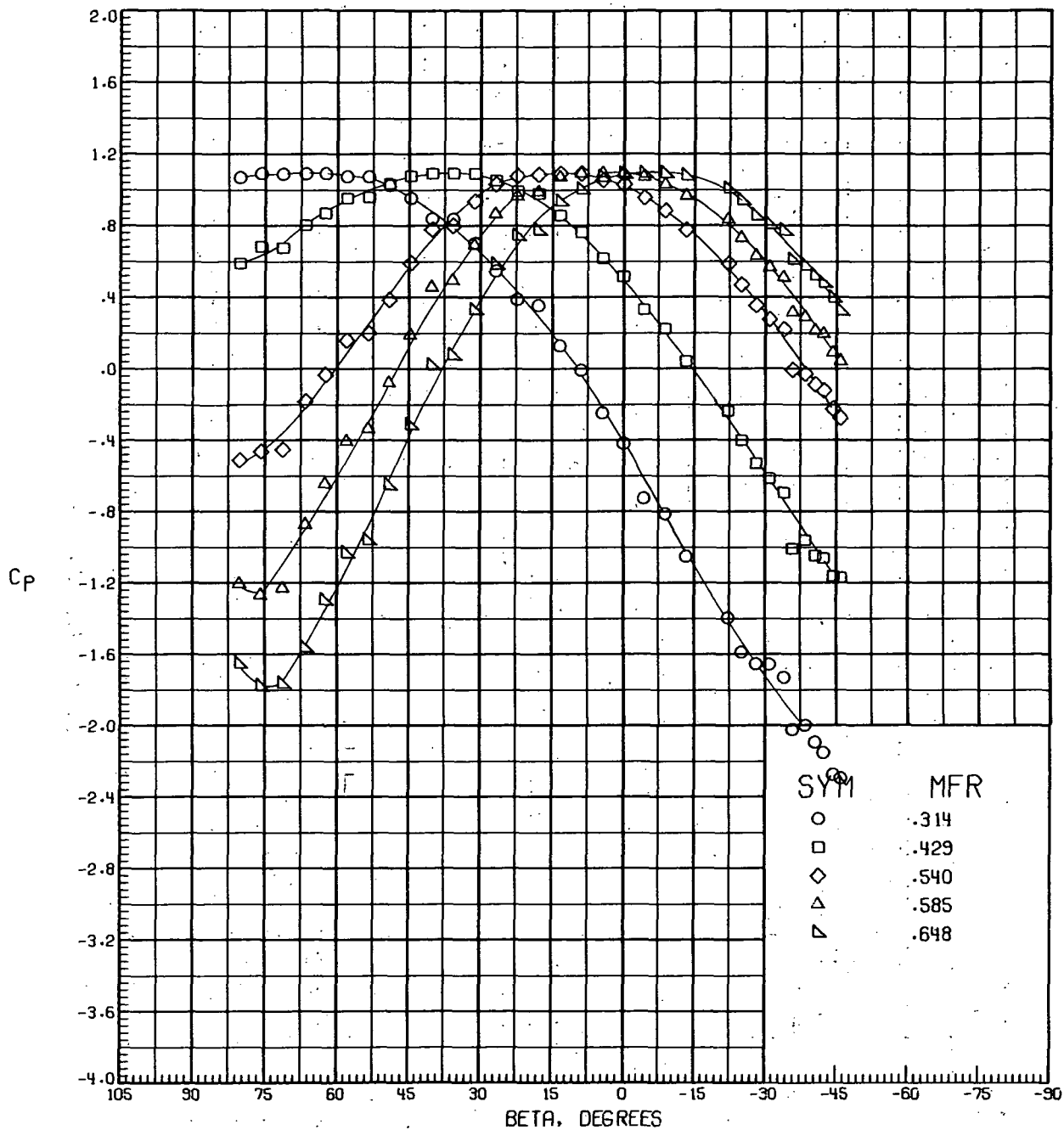
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 31. - Continued.



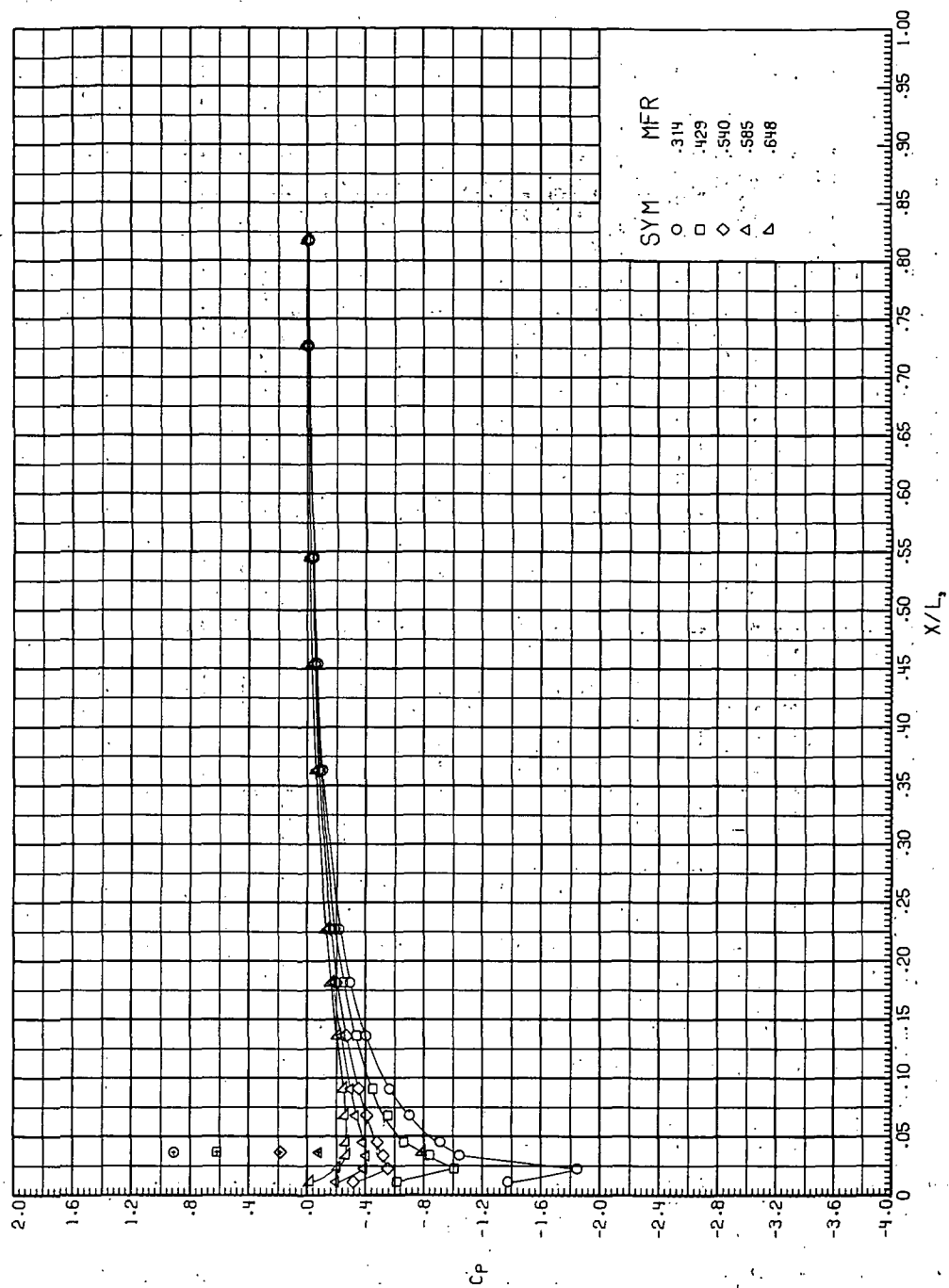
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



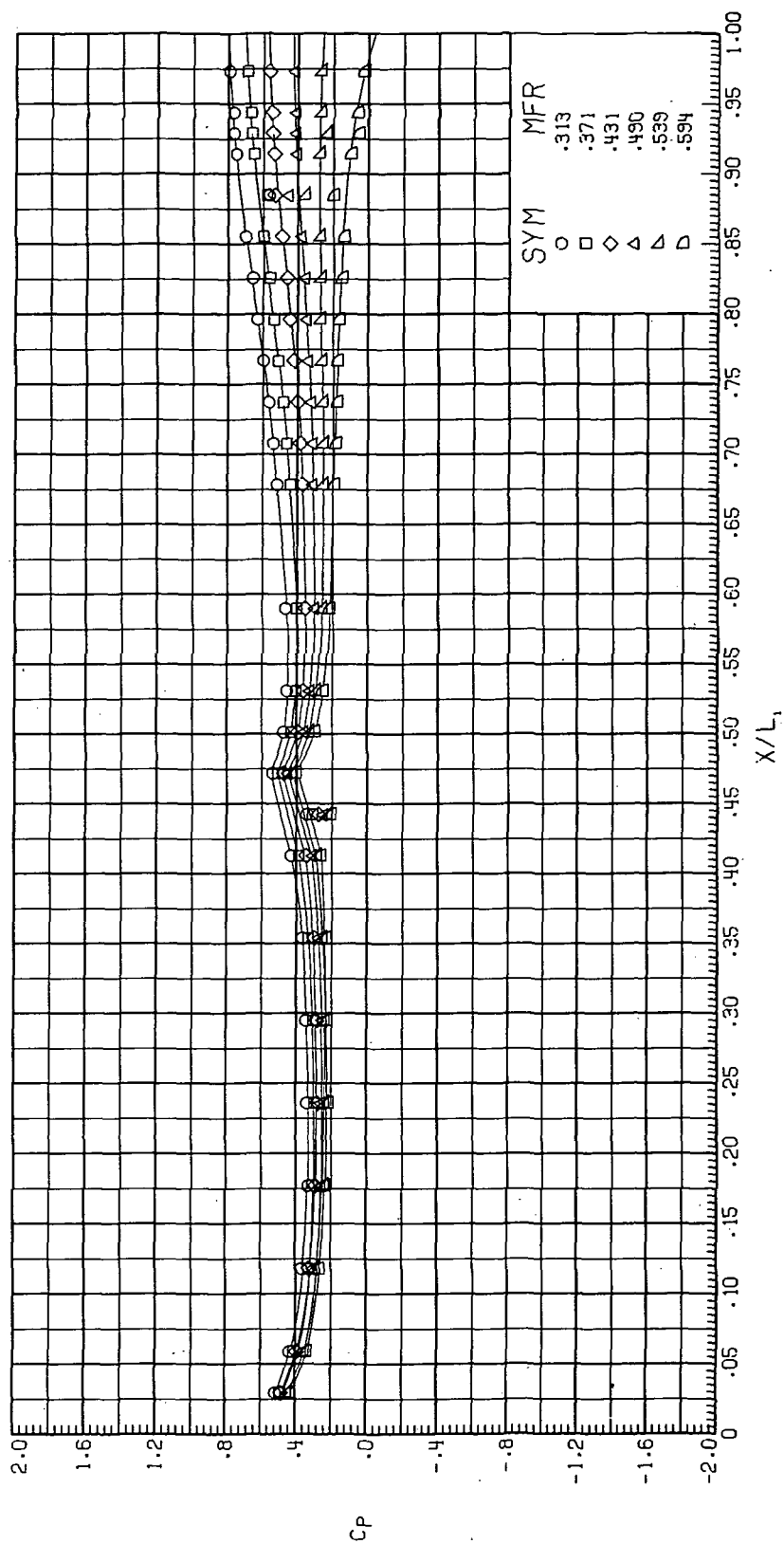
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



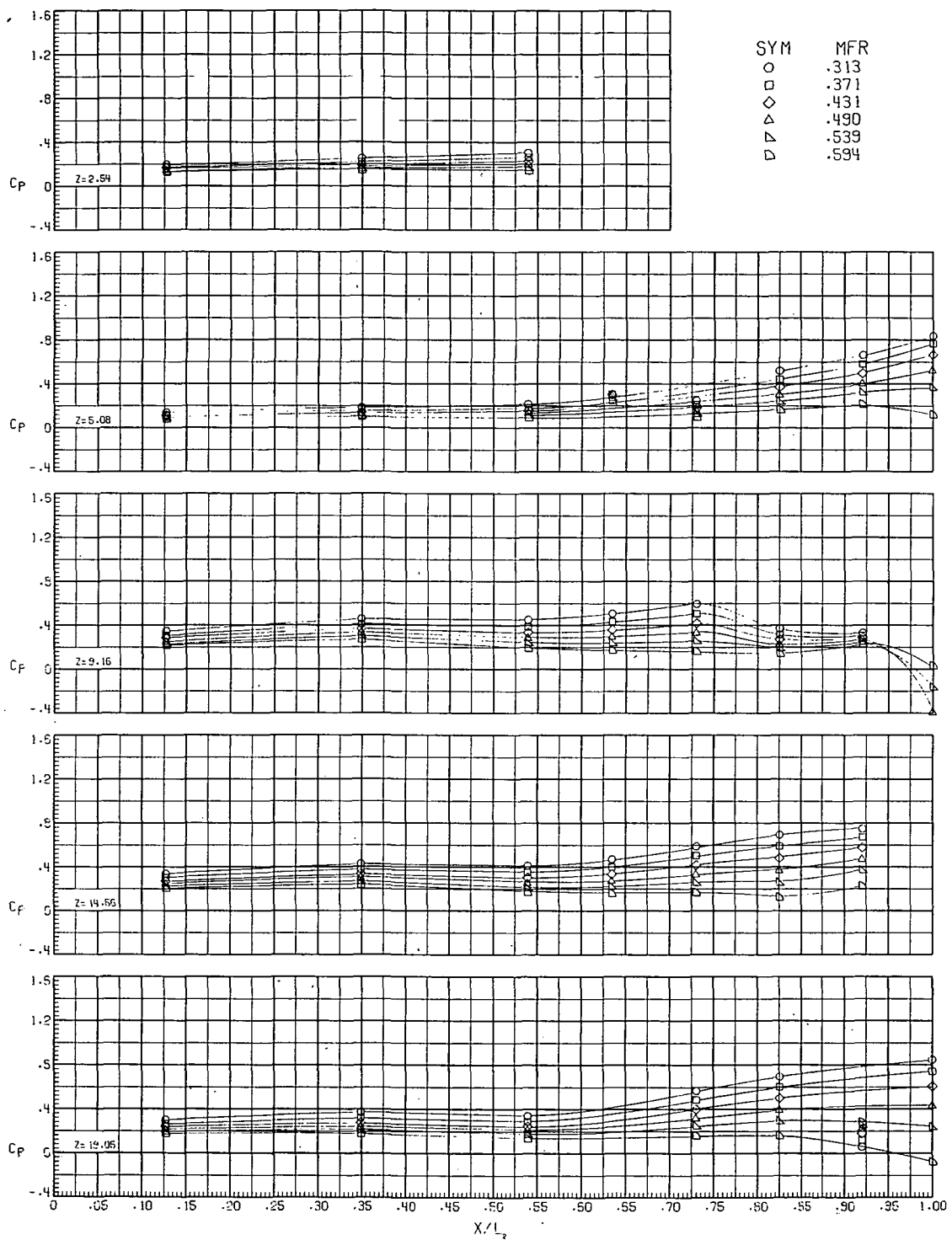
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



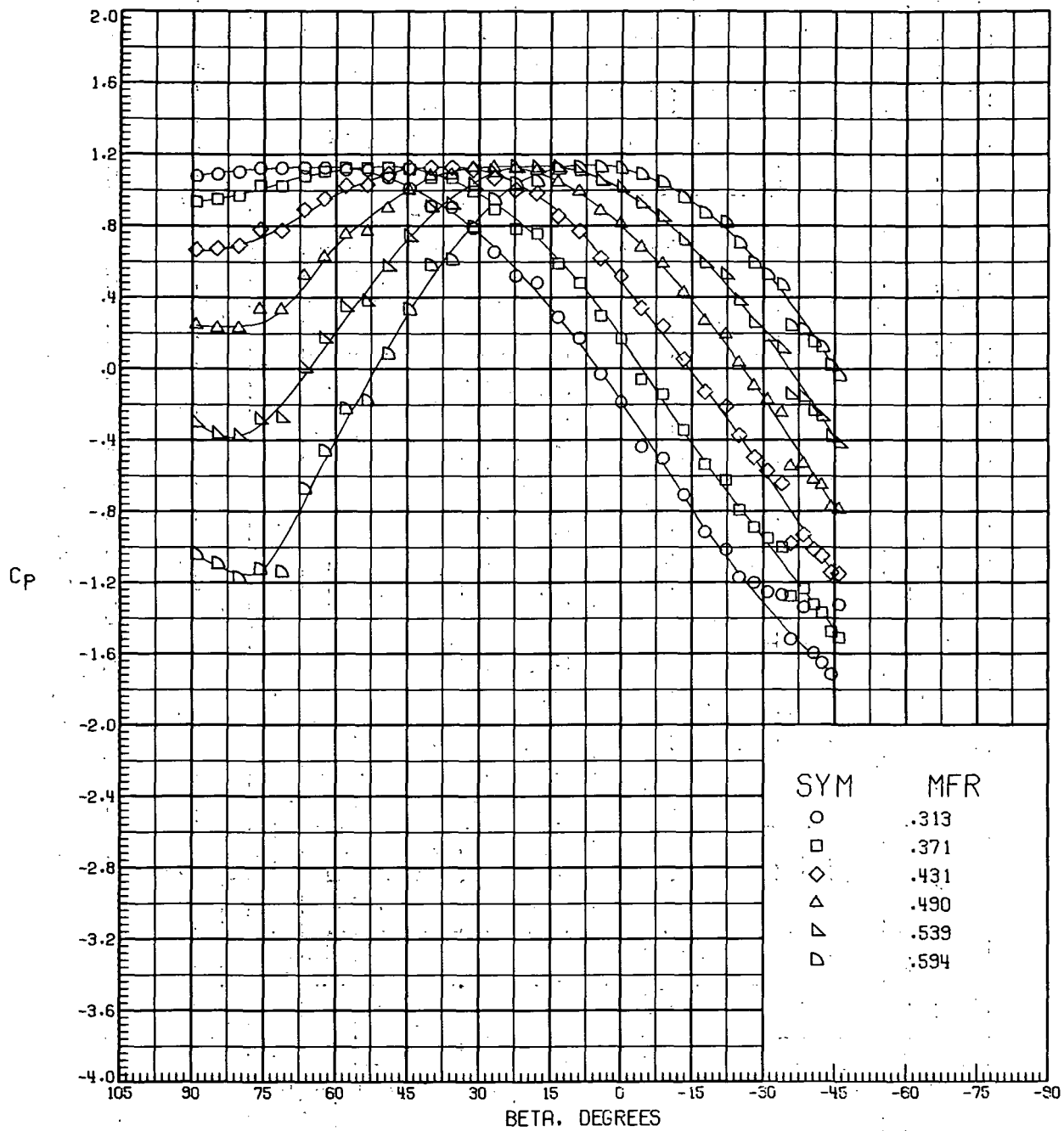
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



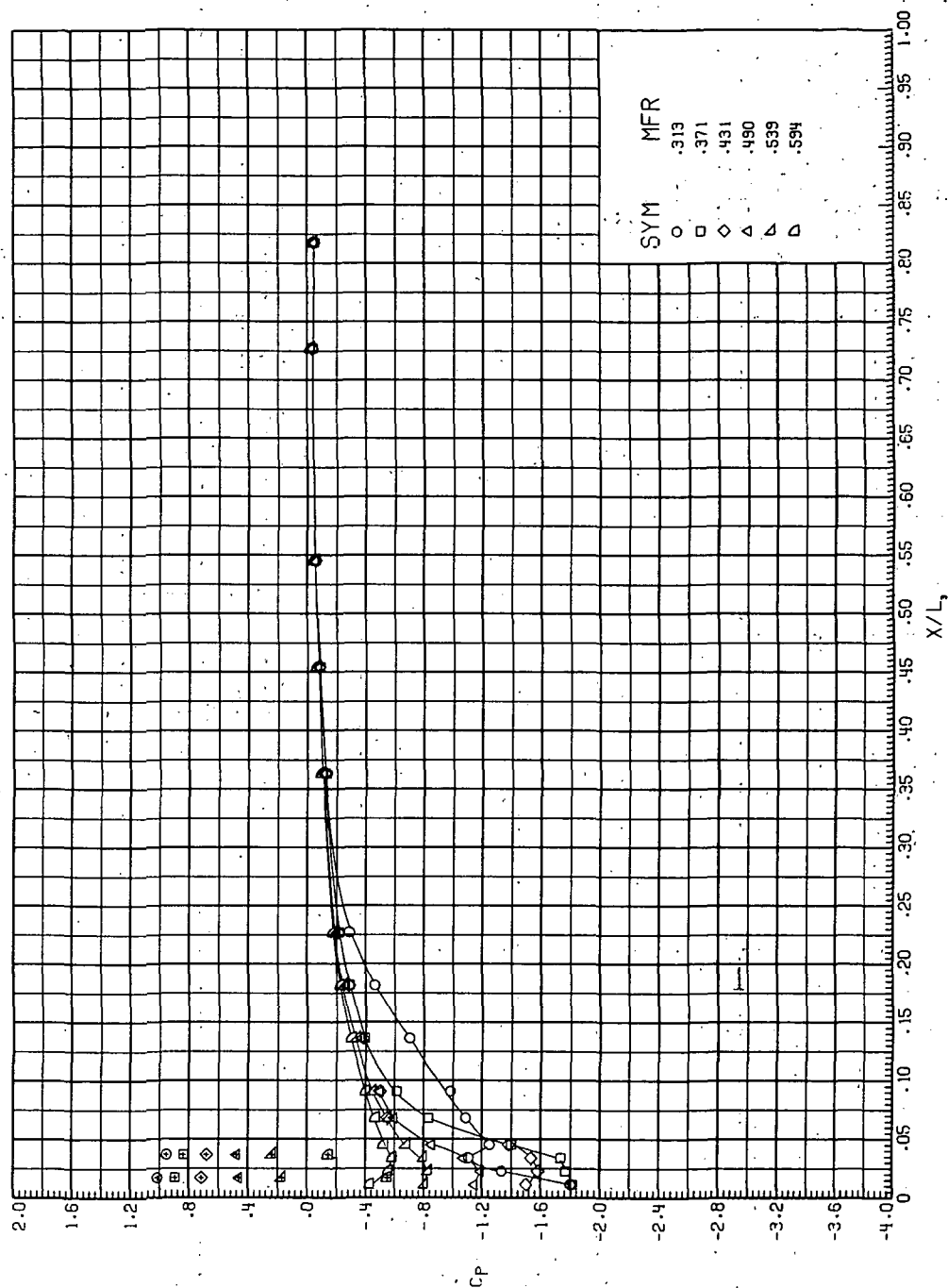
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



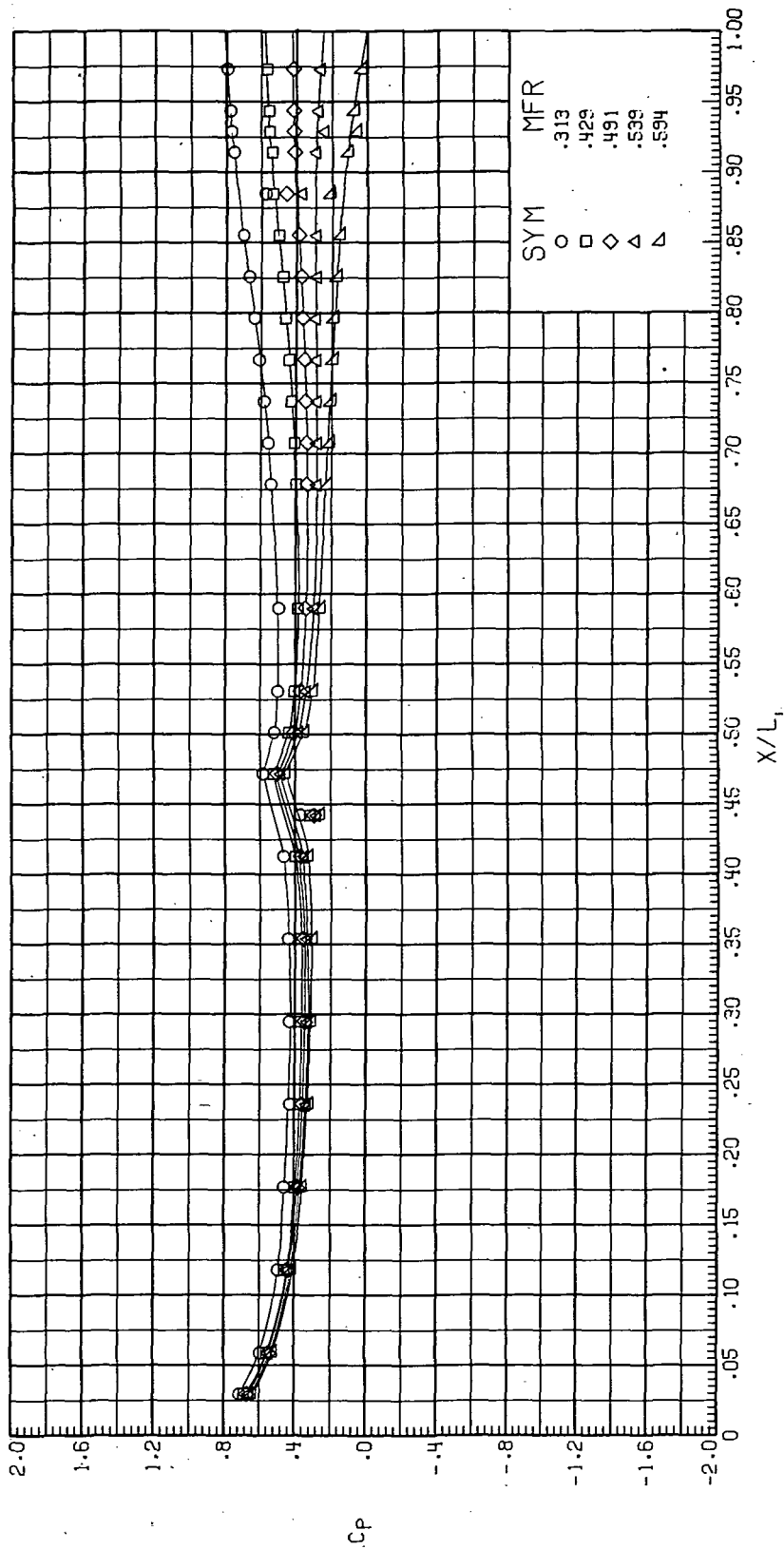
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



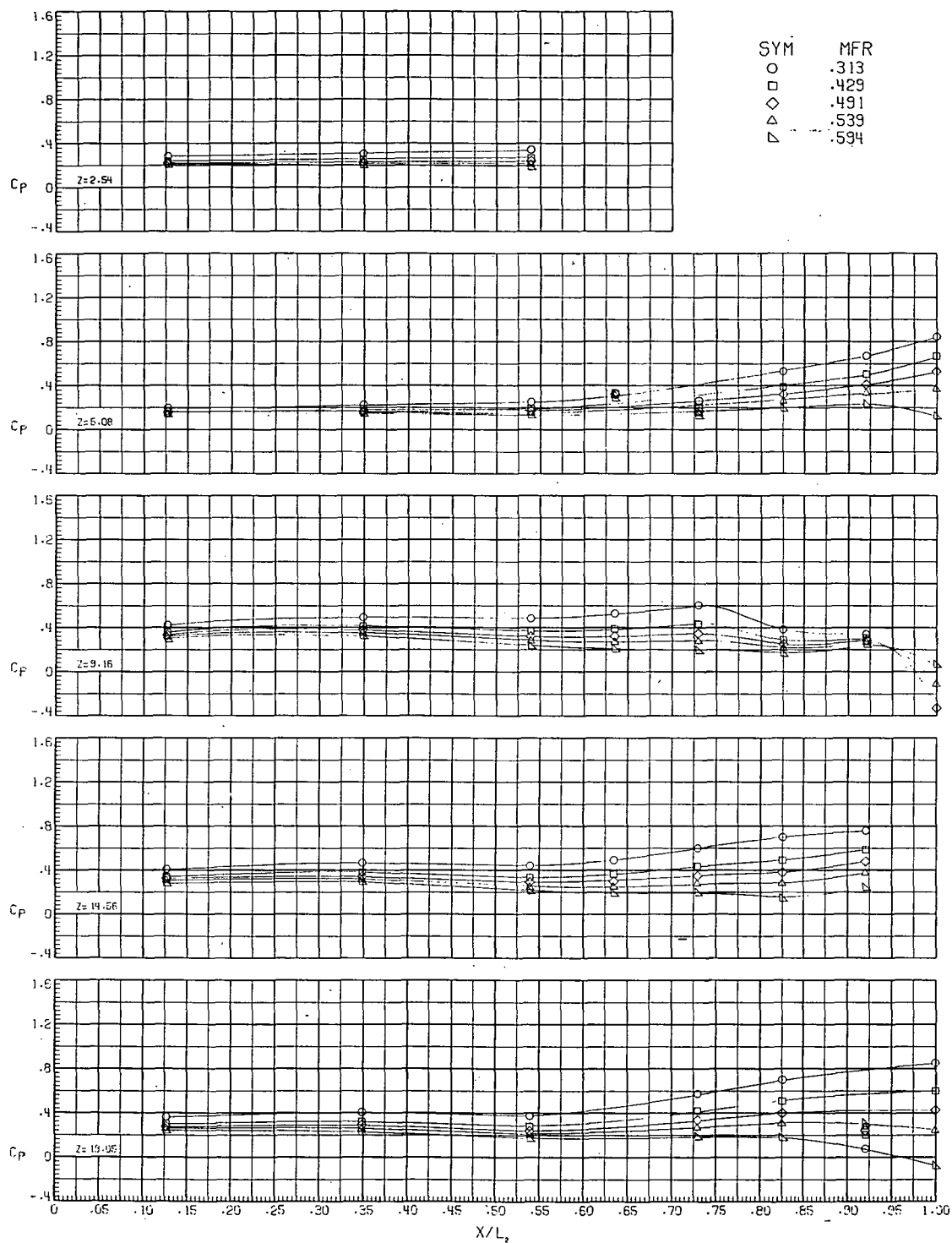
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



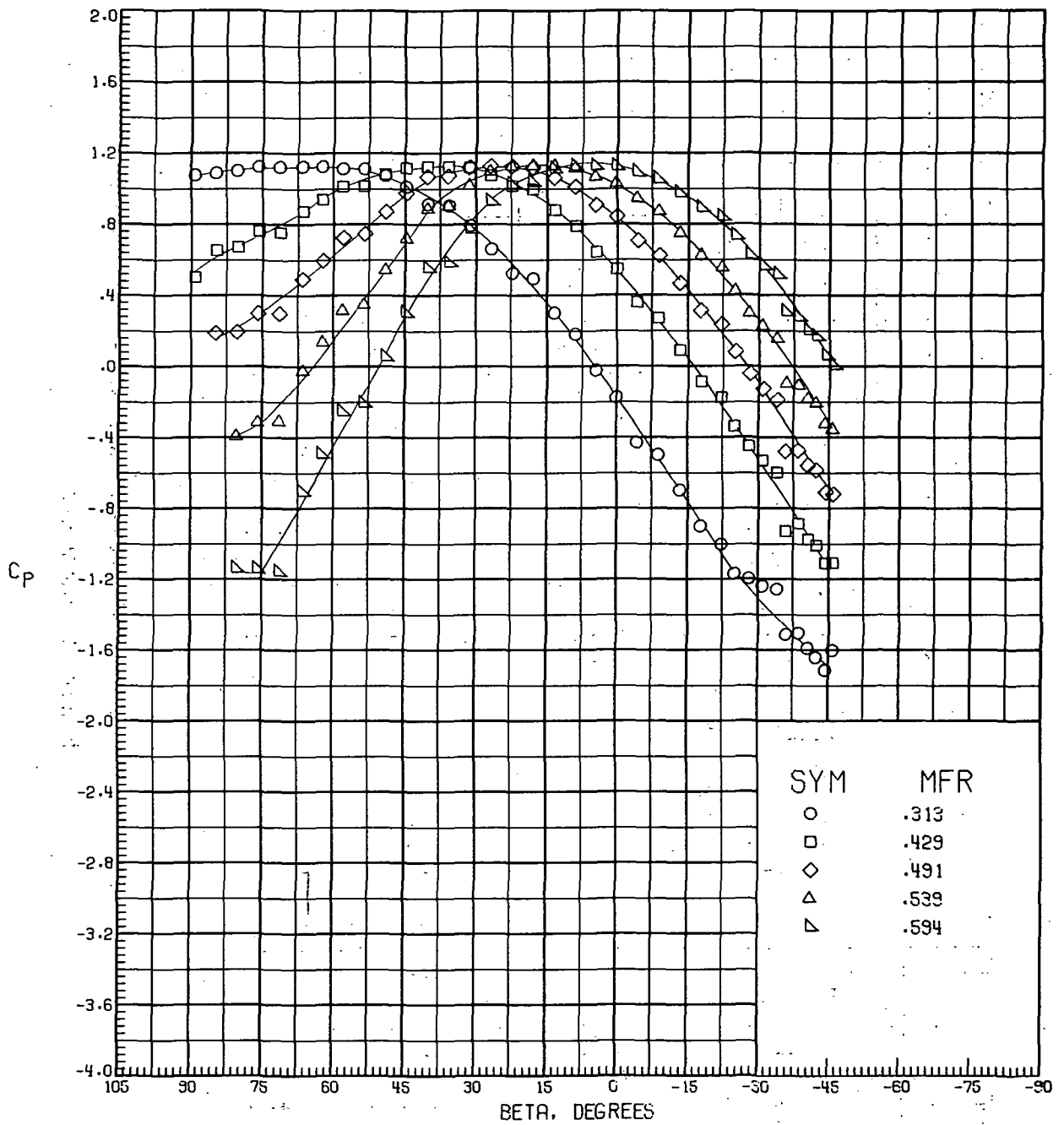
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



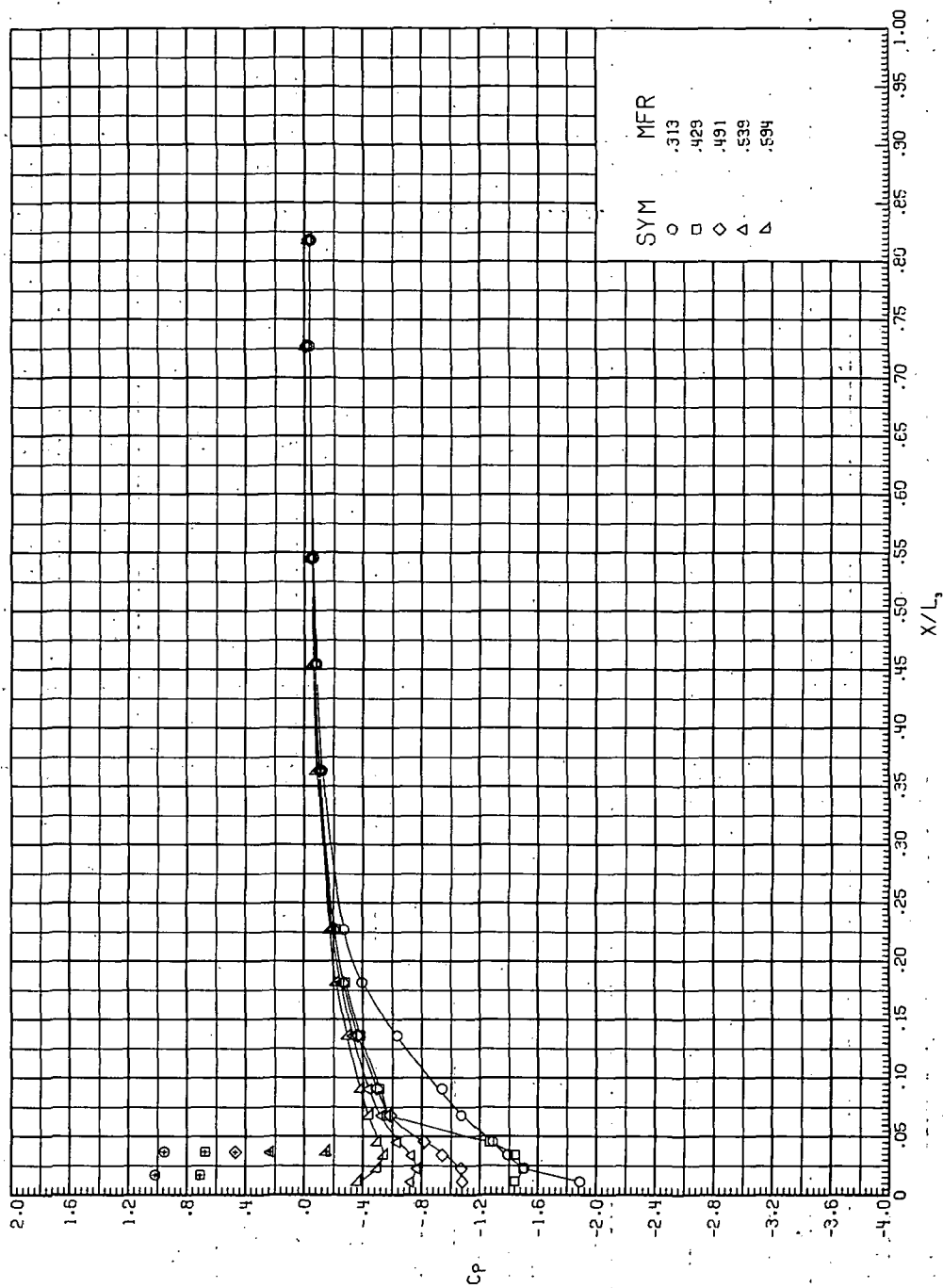
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



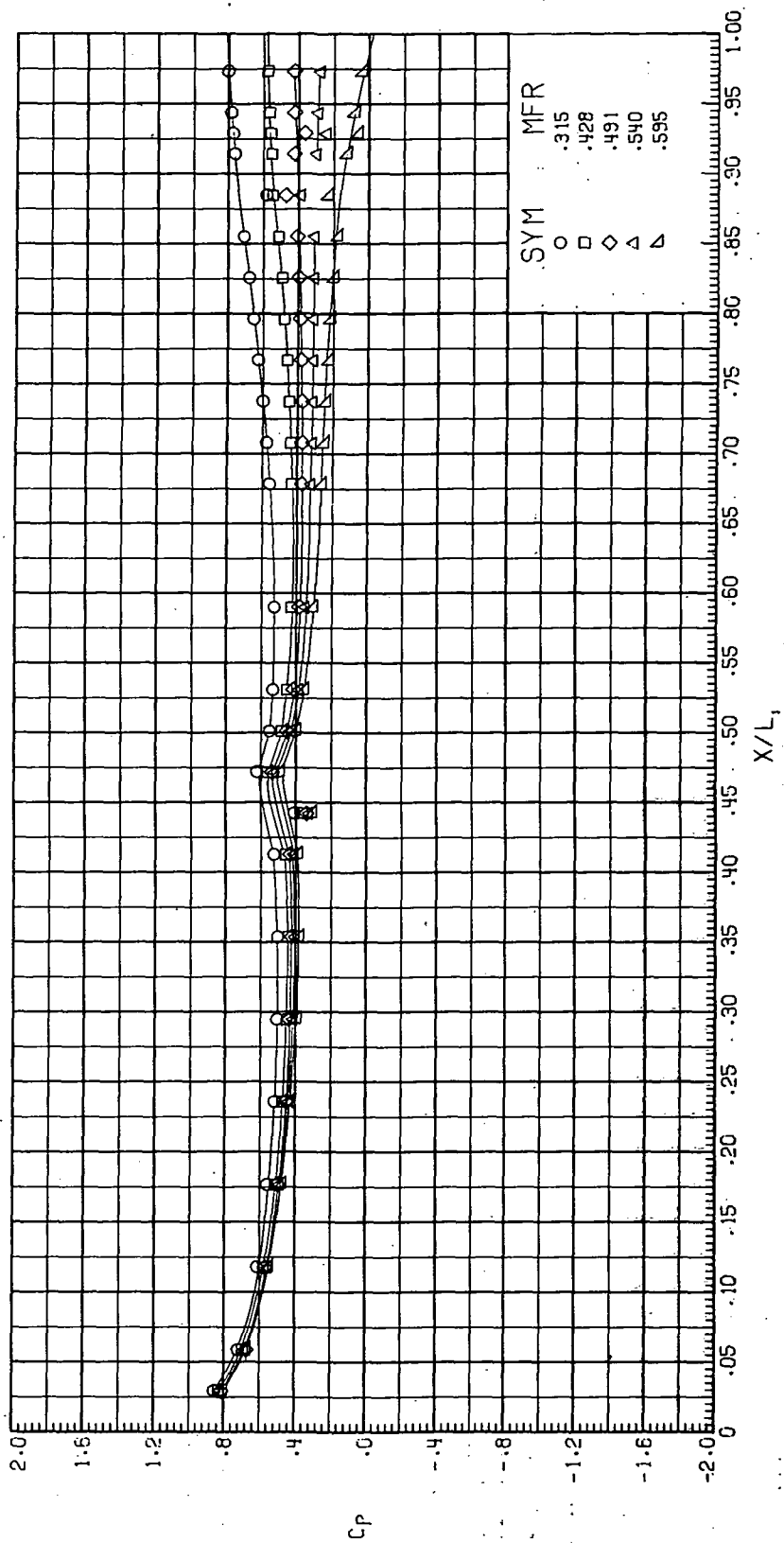
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



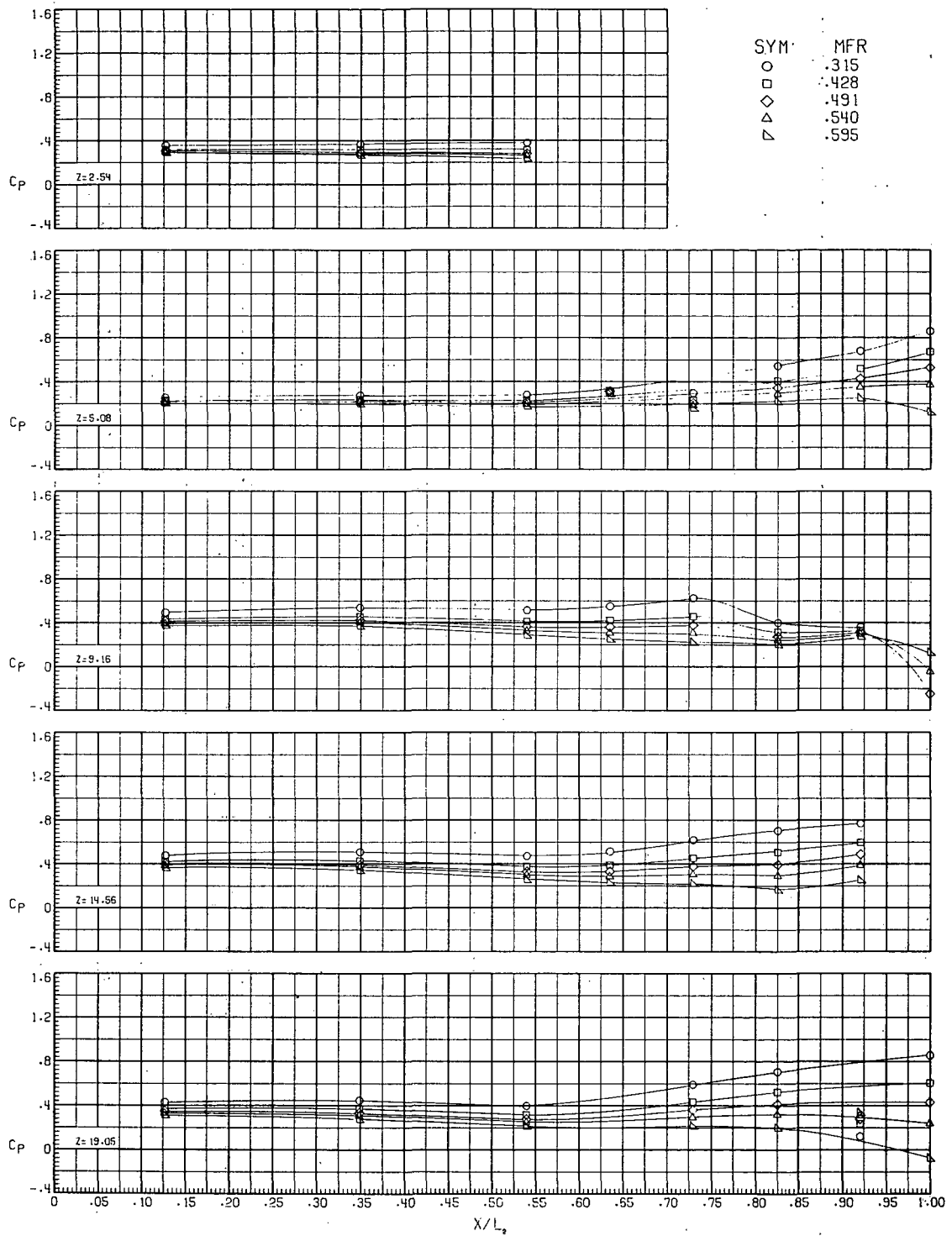
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



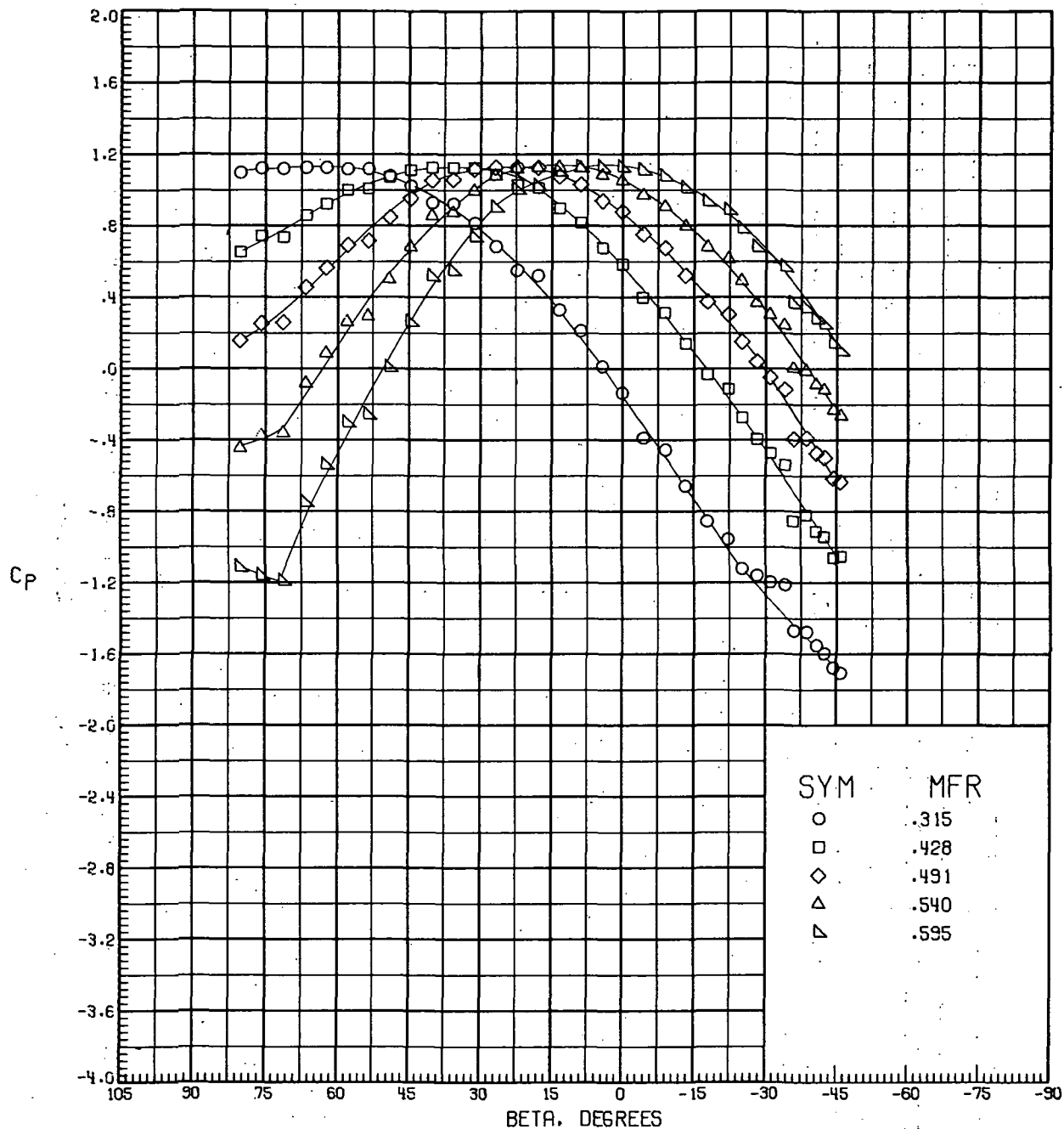
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



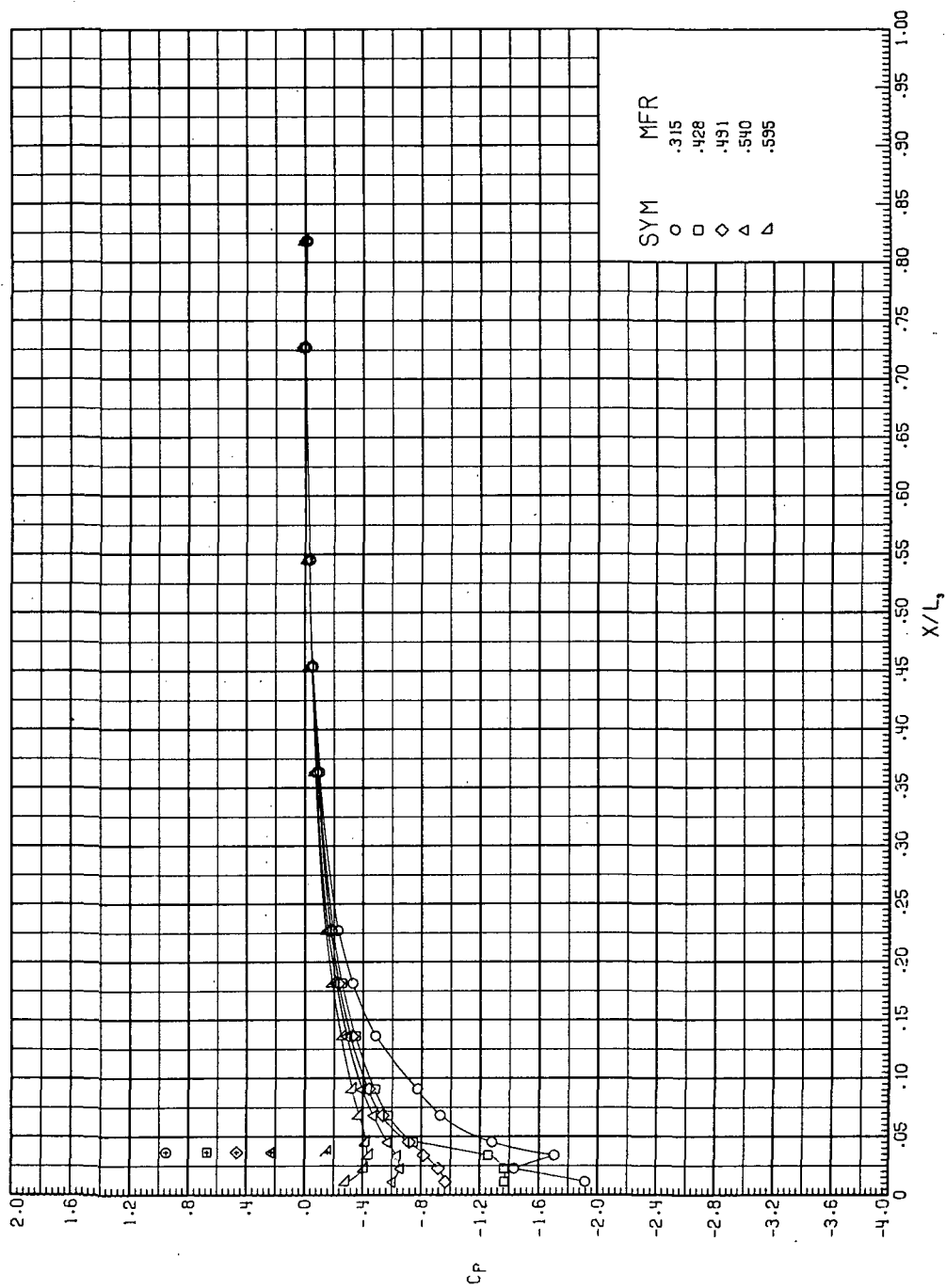
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



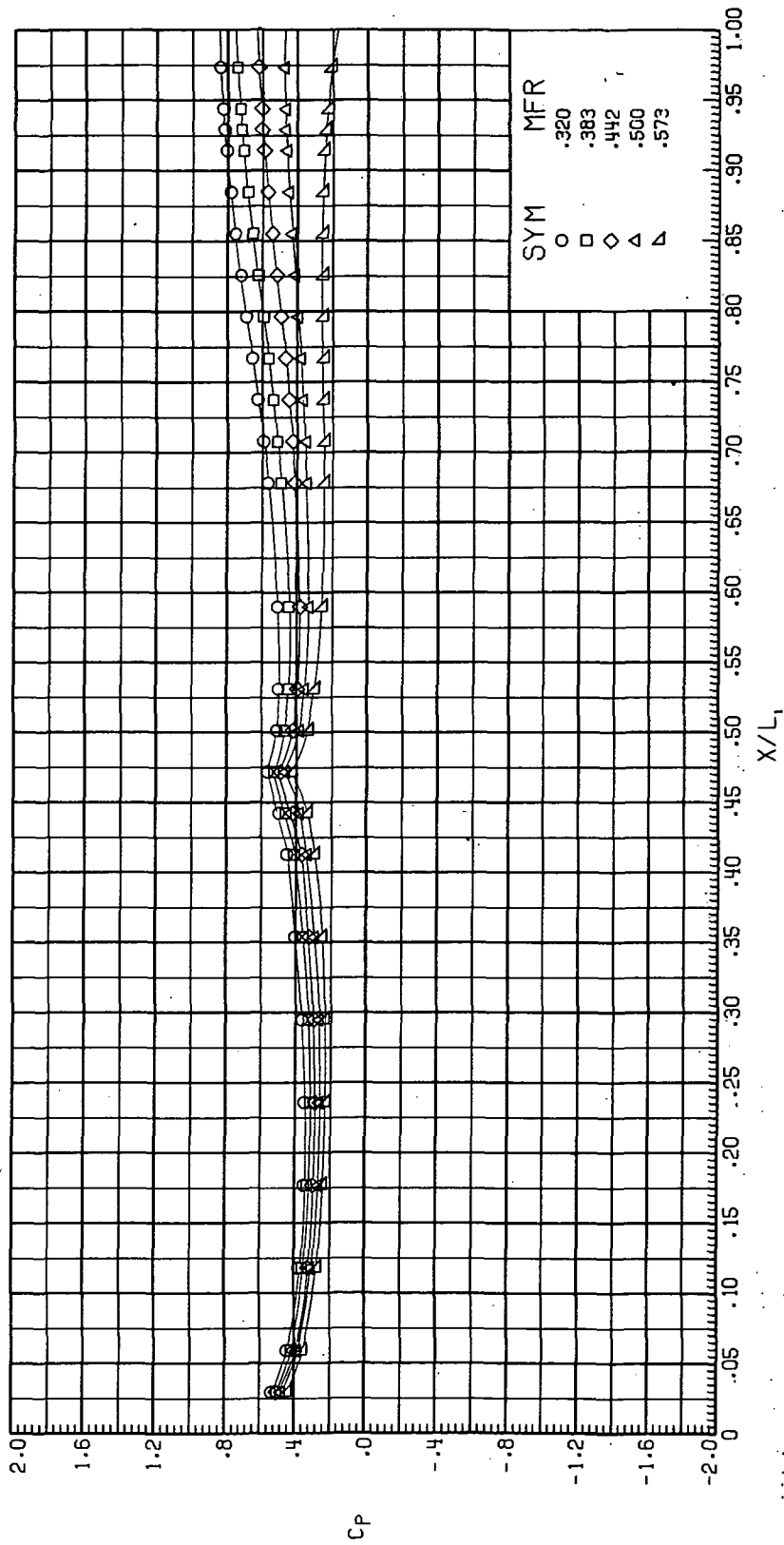
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



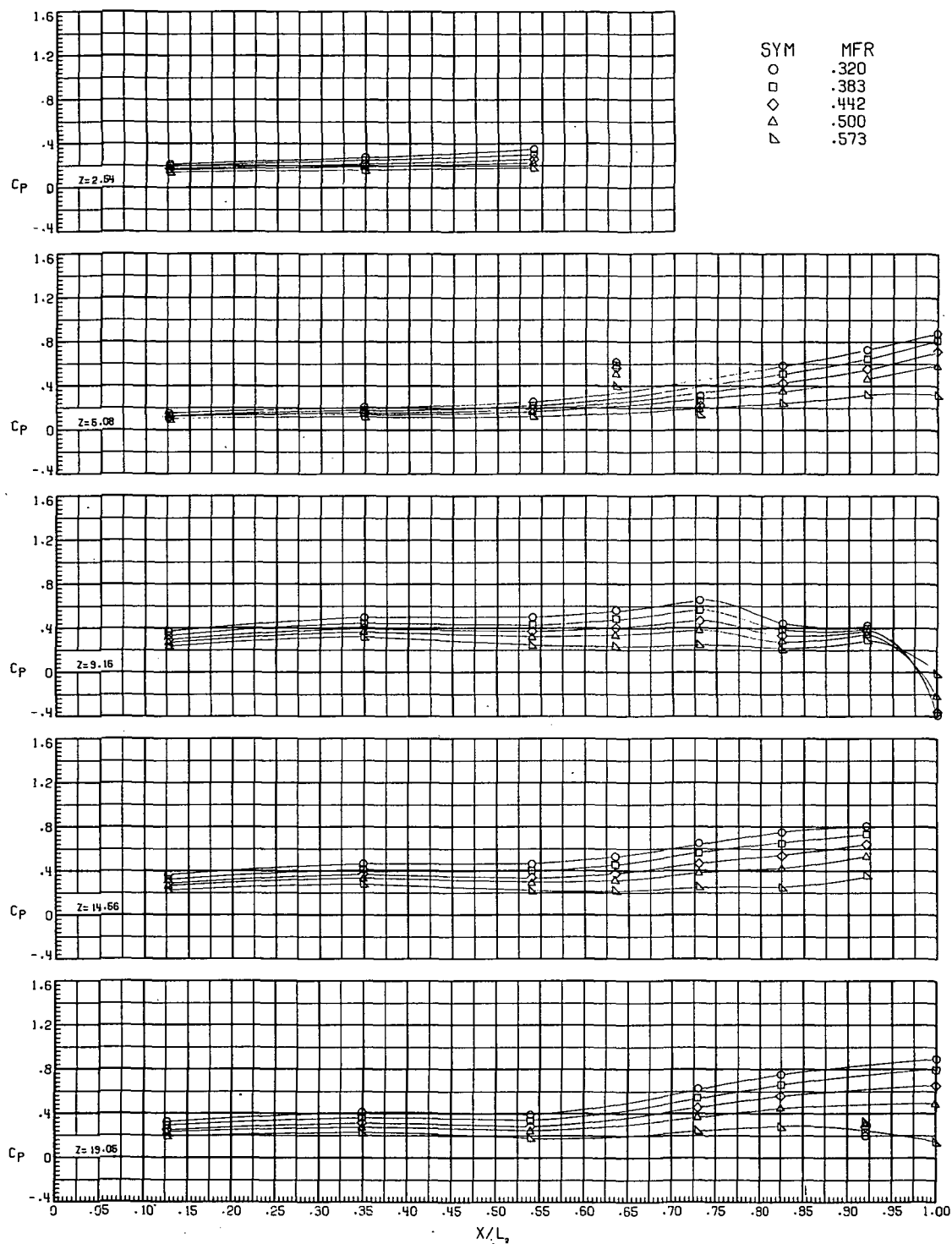
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



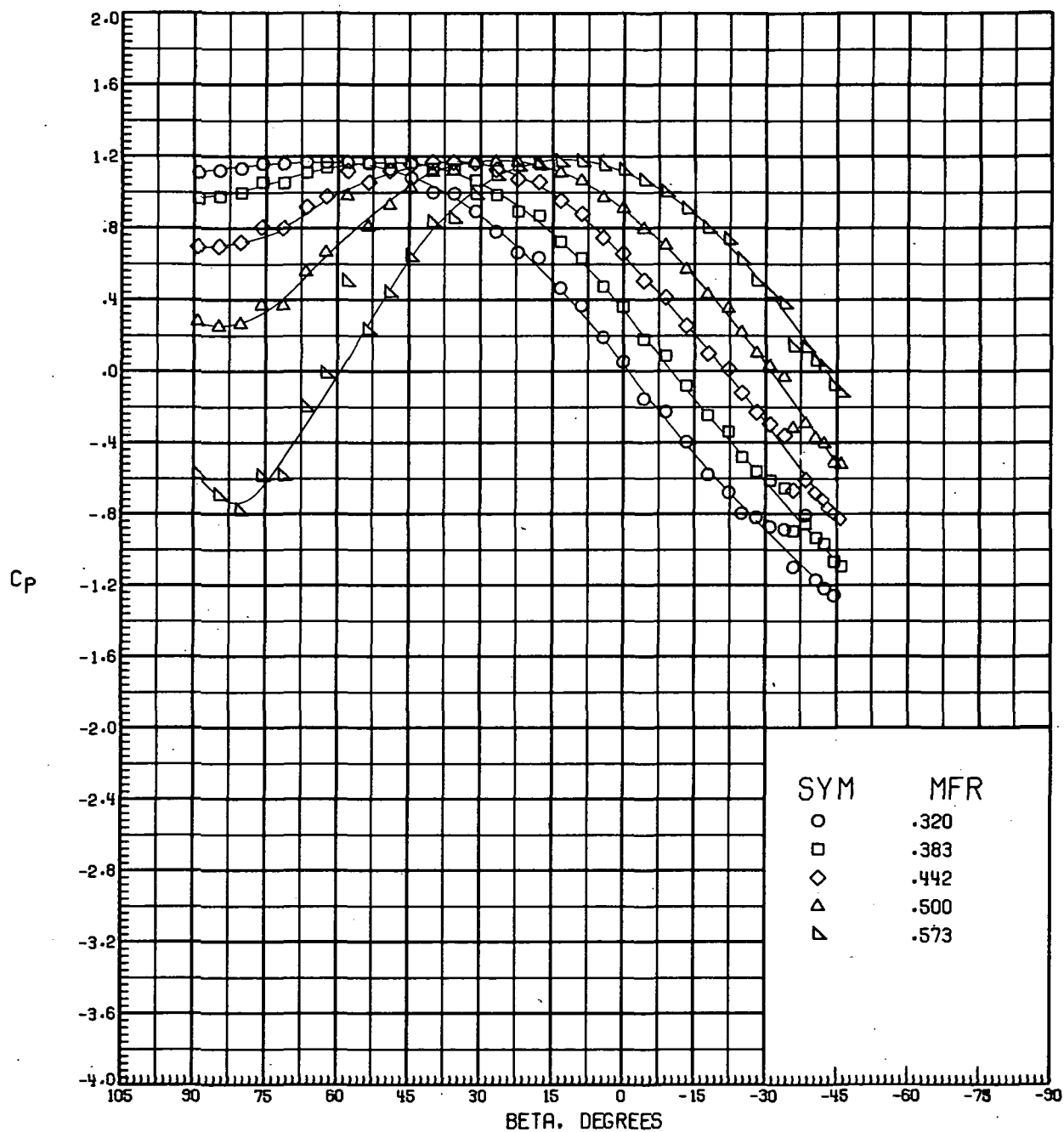
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



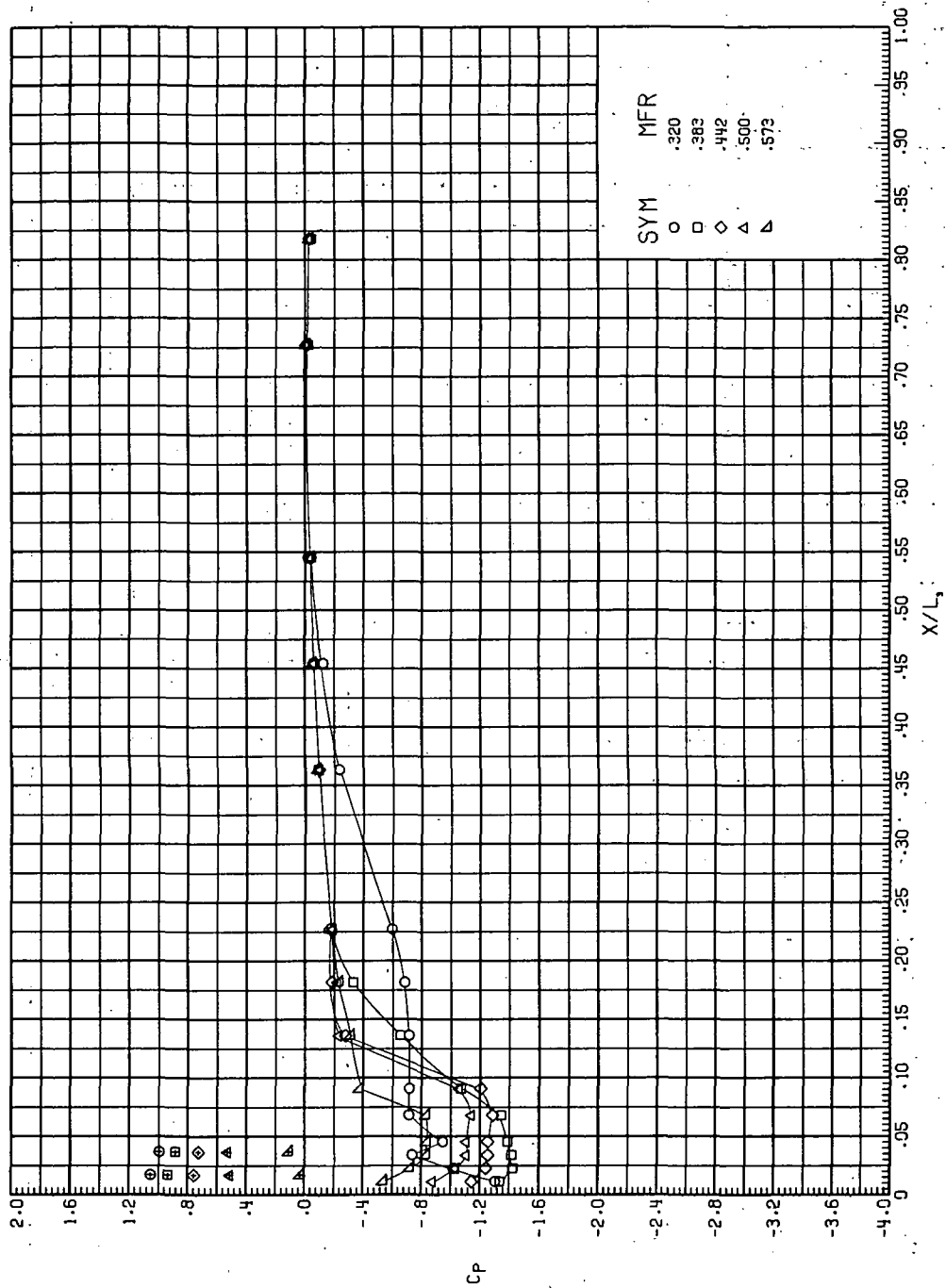
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



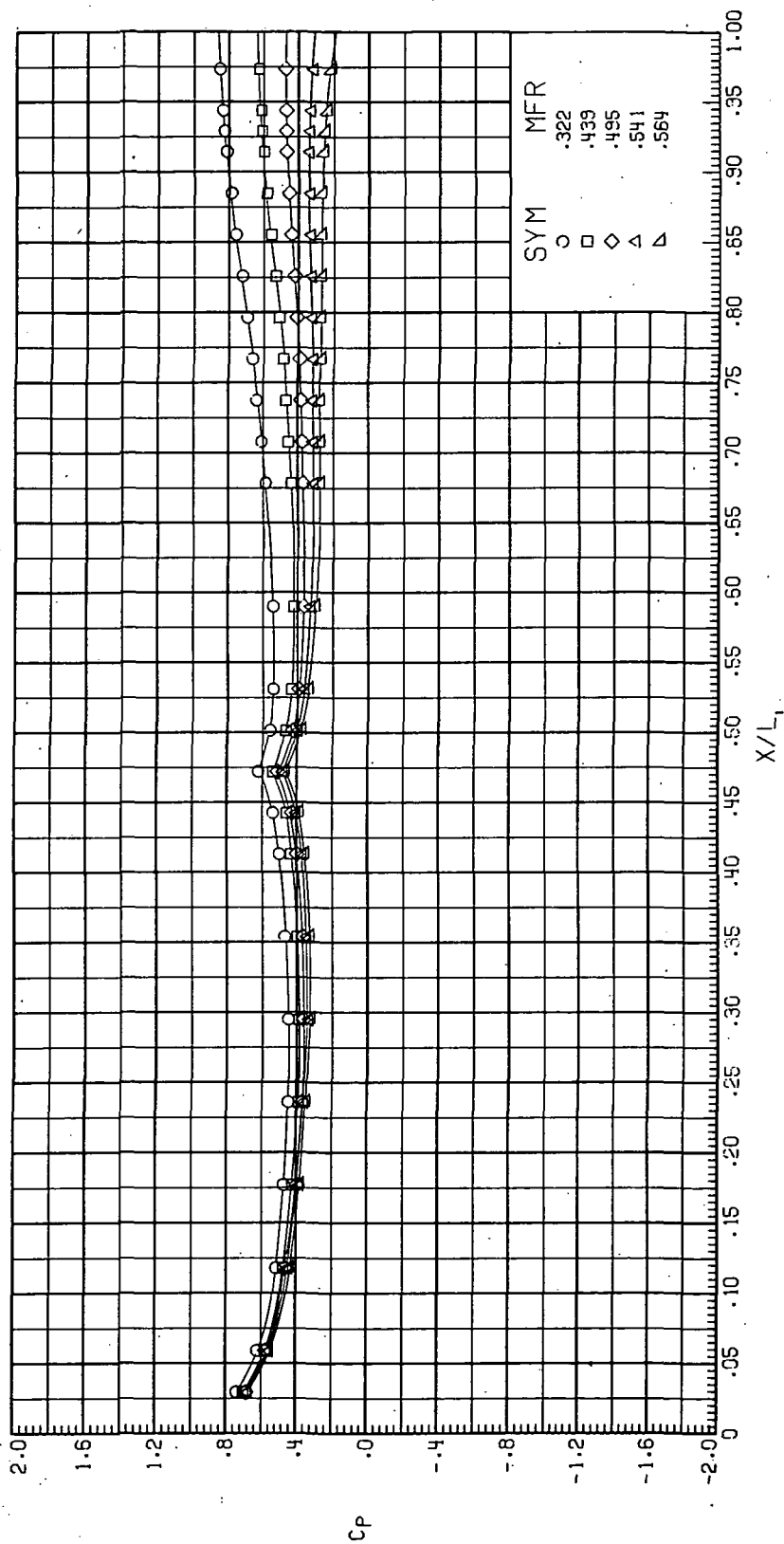
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



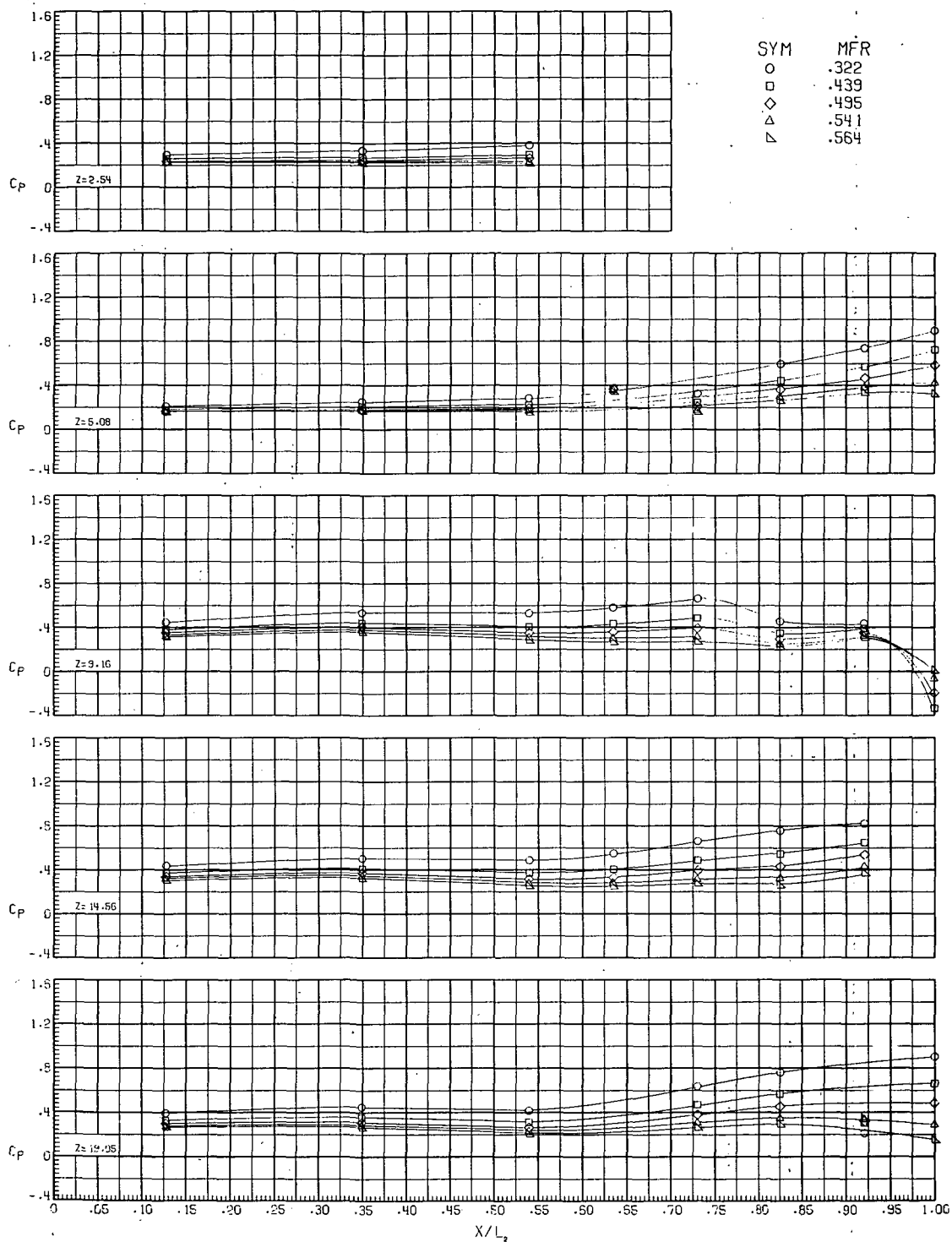
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31.- Continued.



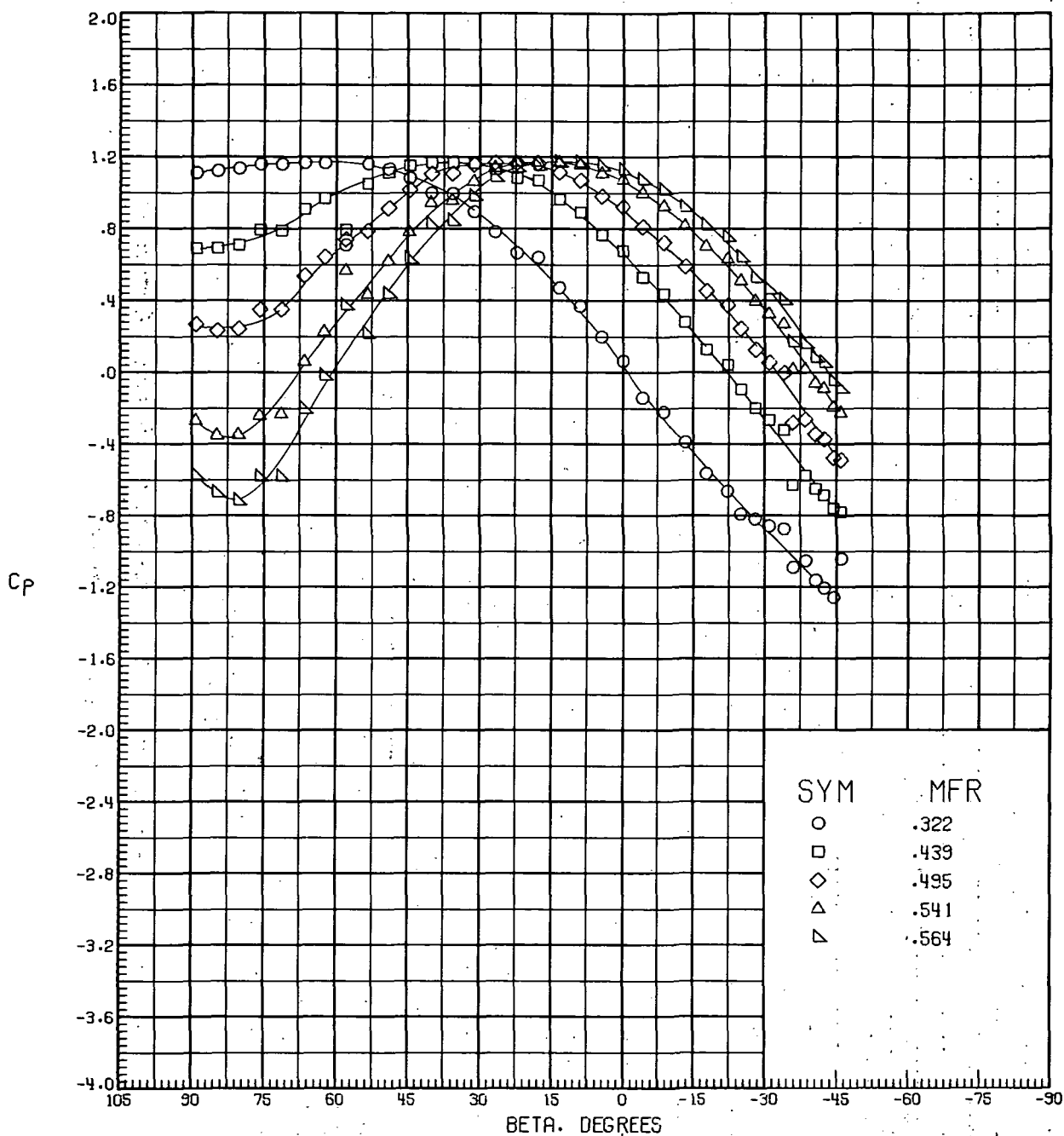
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



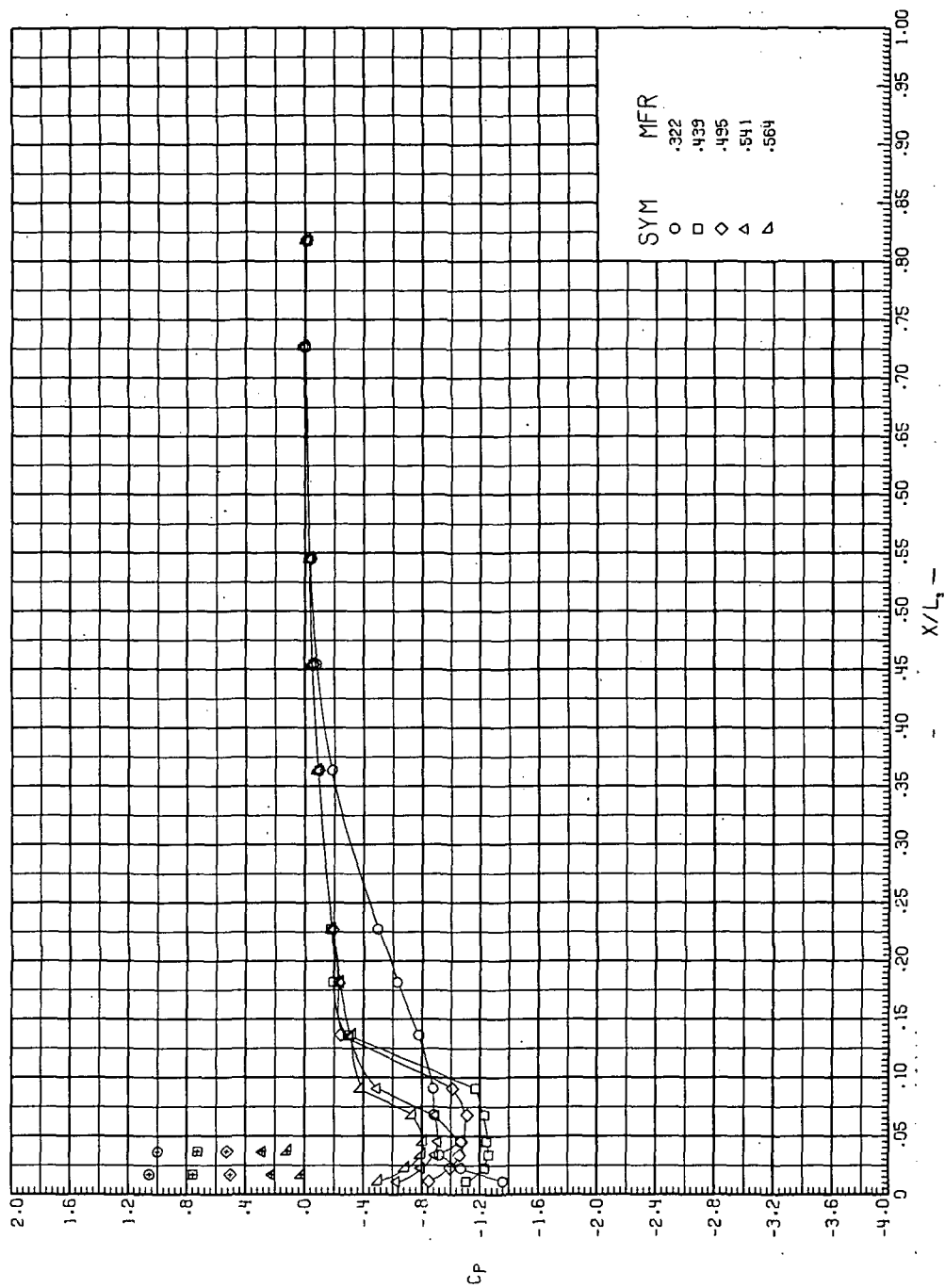
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



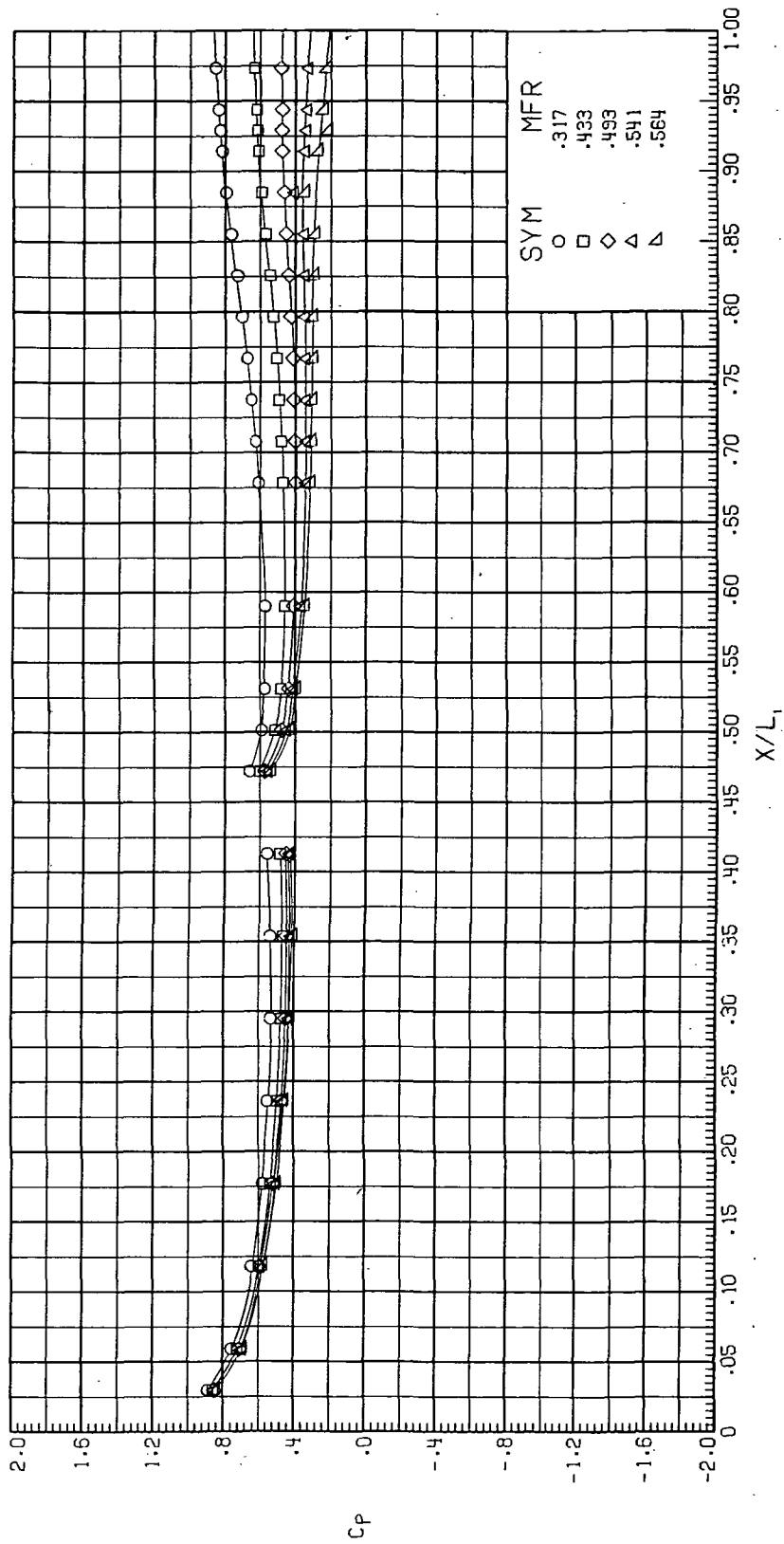
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



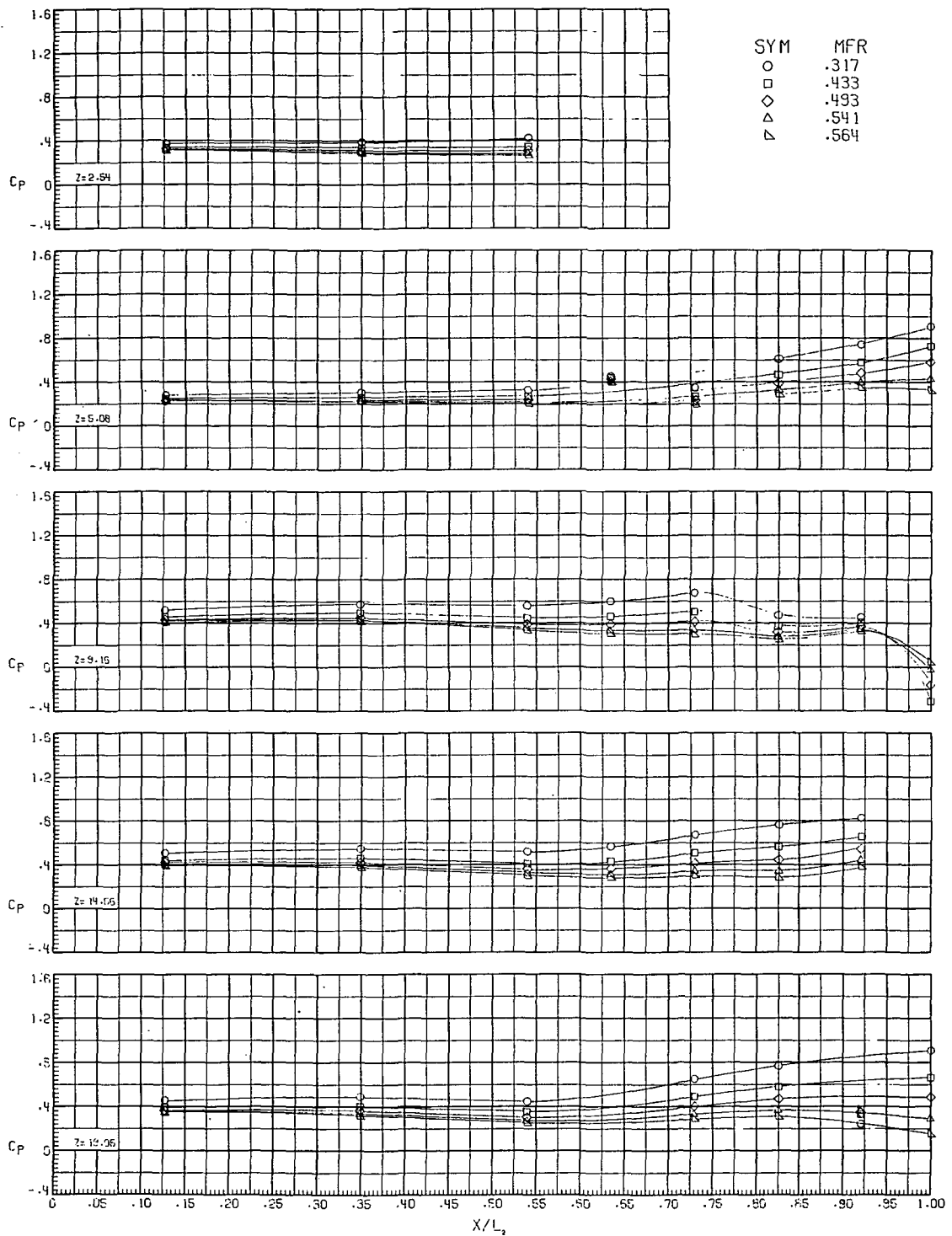
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31. - Continued.



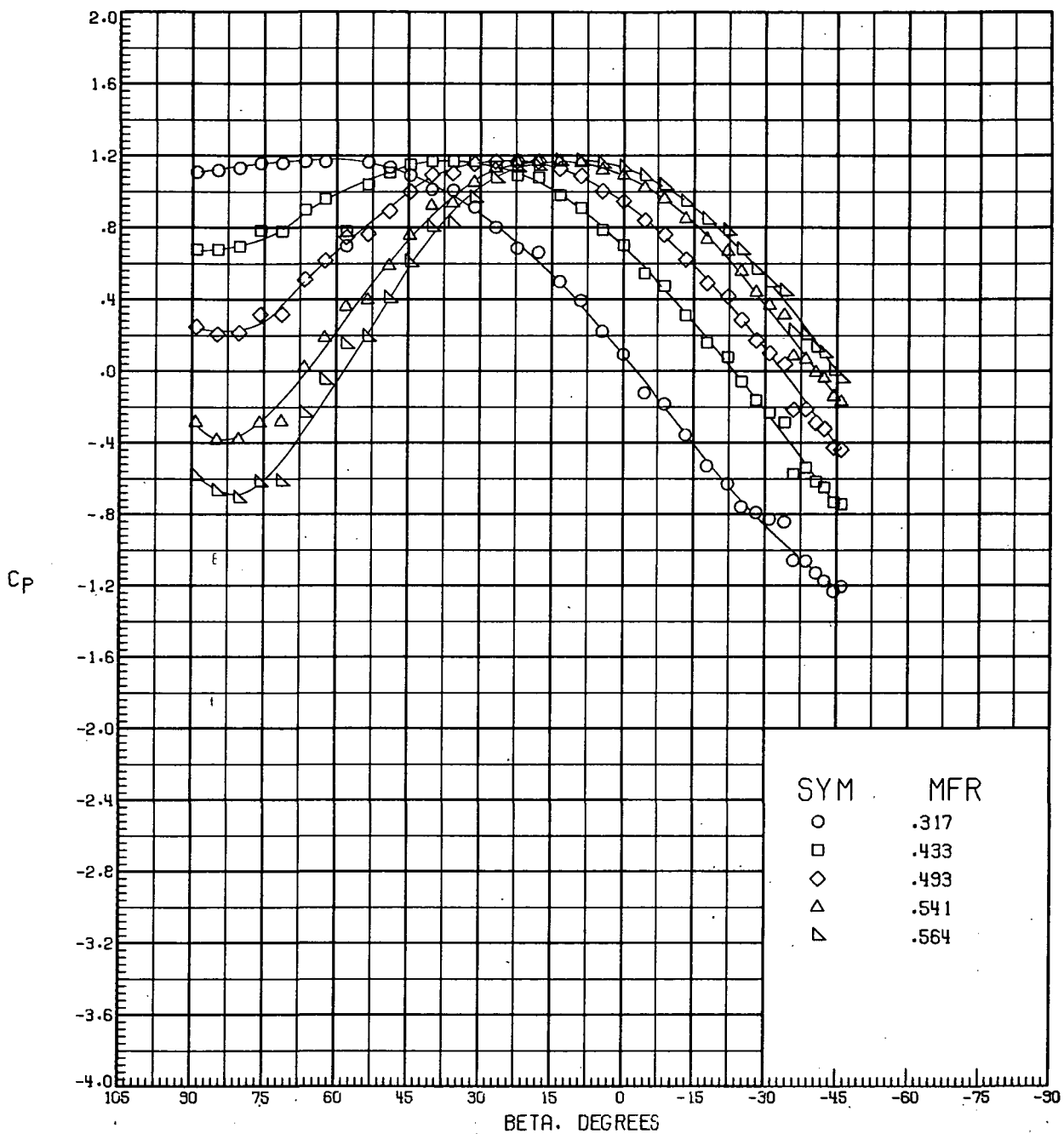
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 31.- Continued.



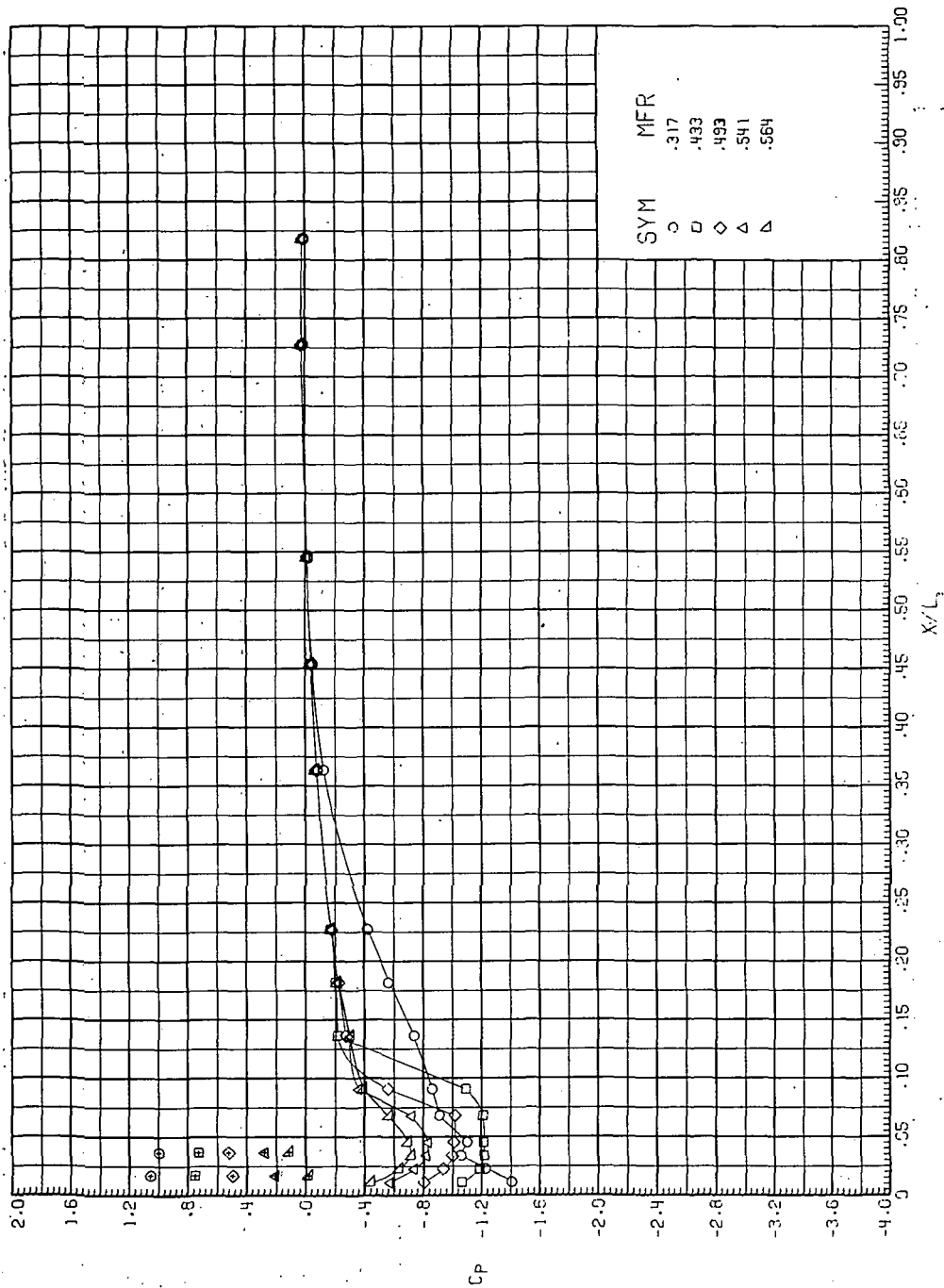
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 31.- Continued.



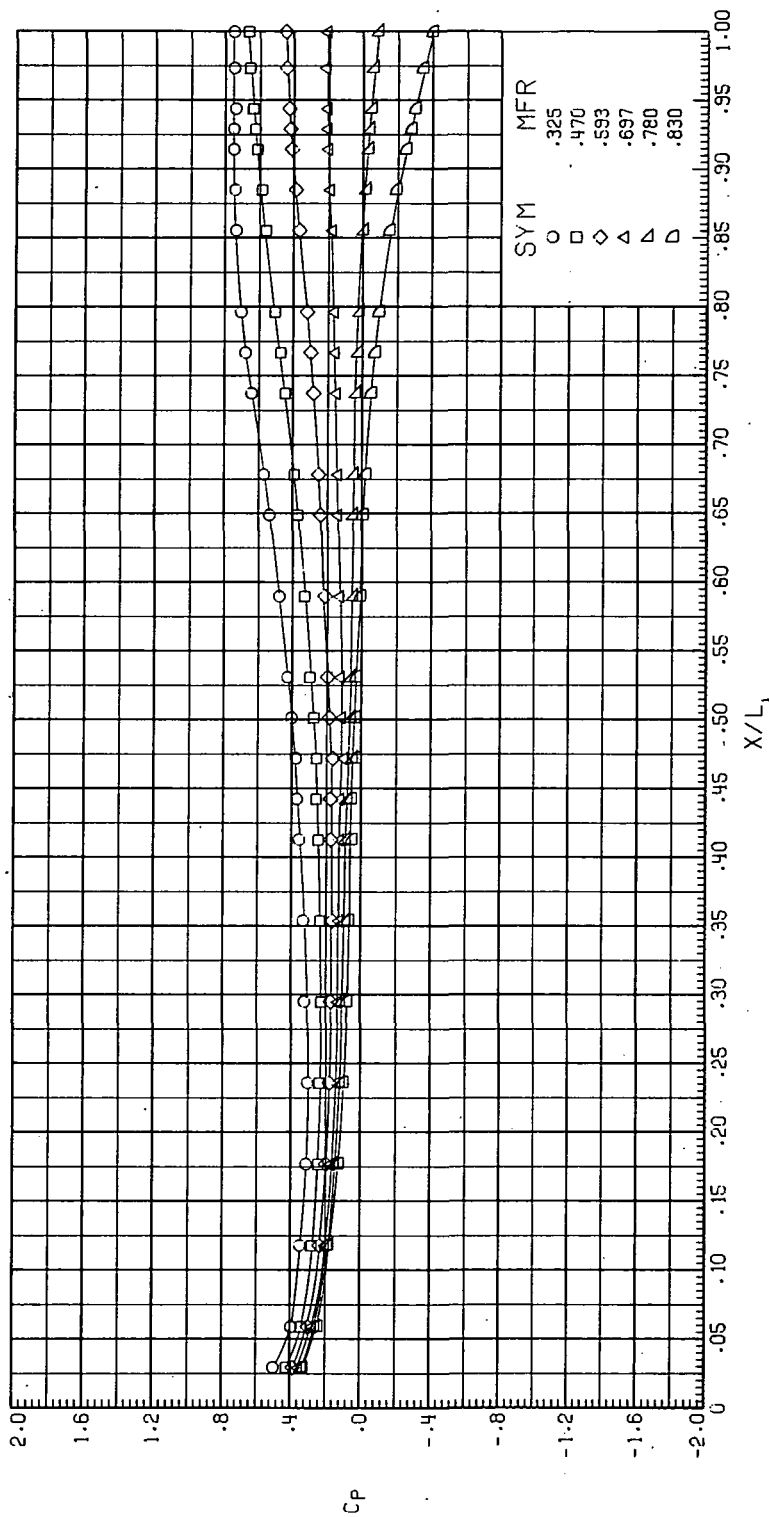
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients. Continued.

Figure 31.- Continued.



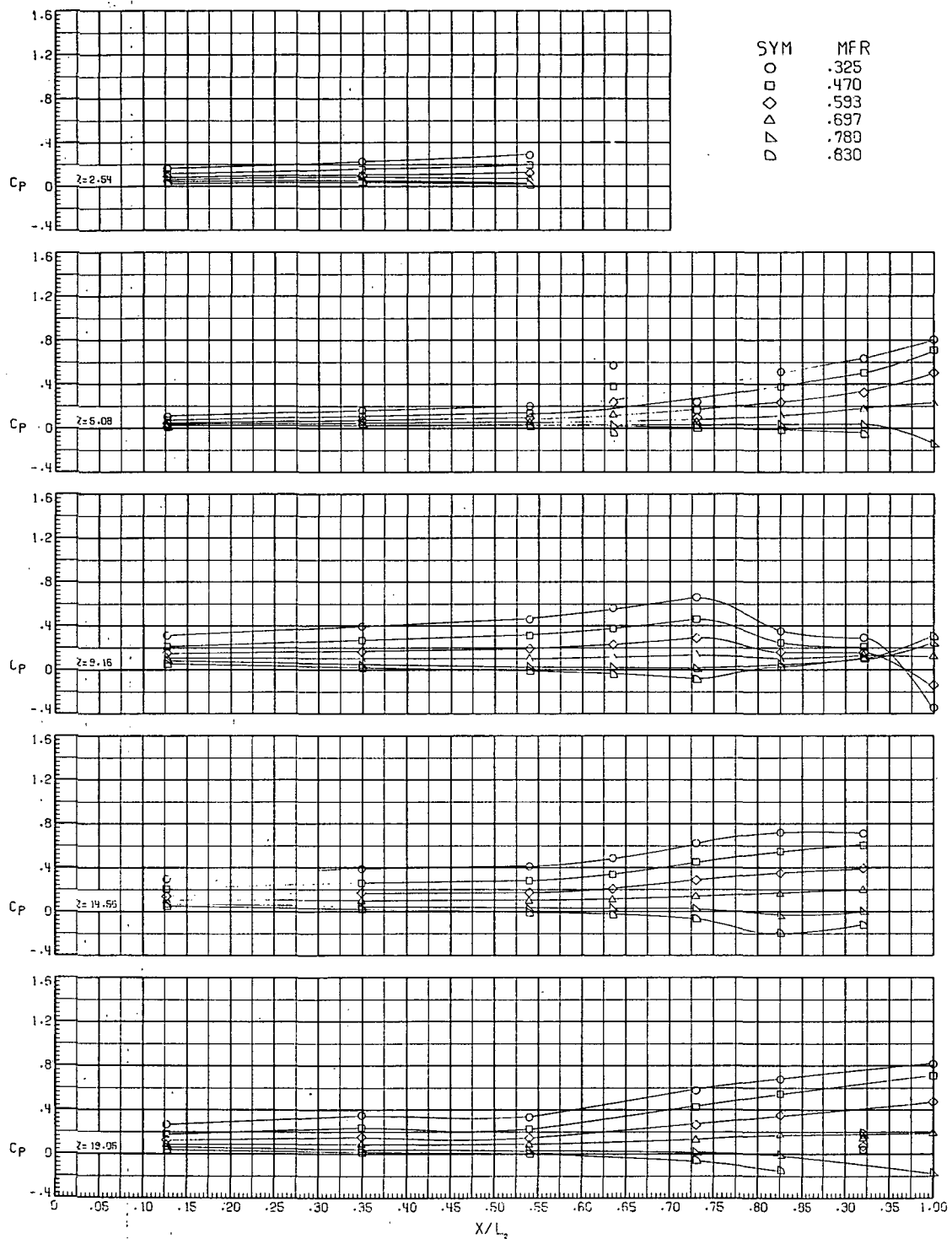
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 31. - Concluded.



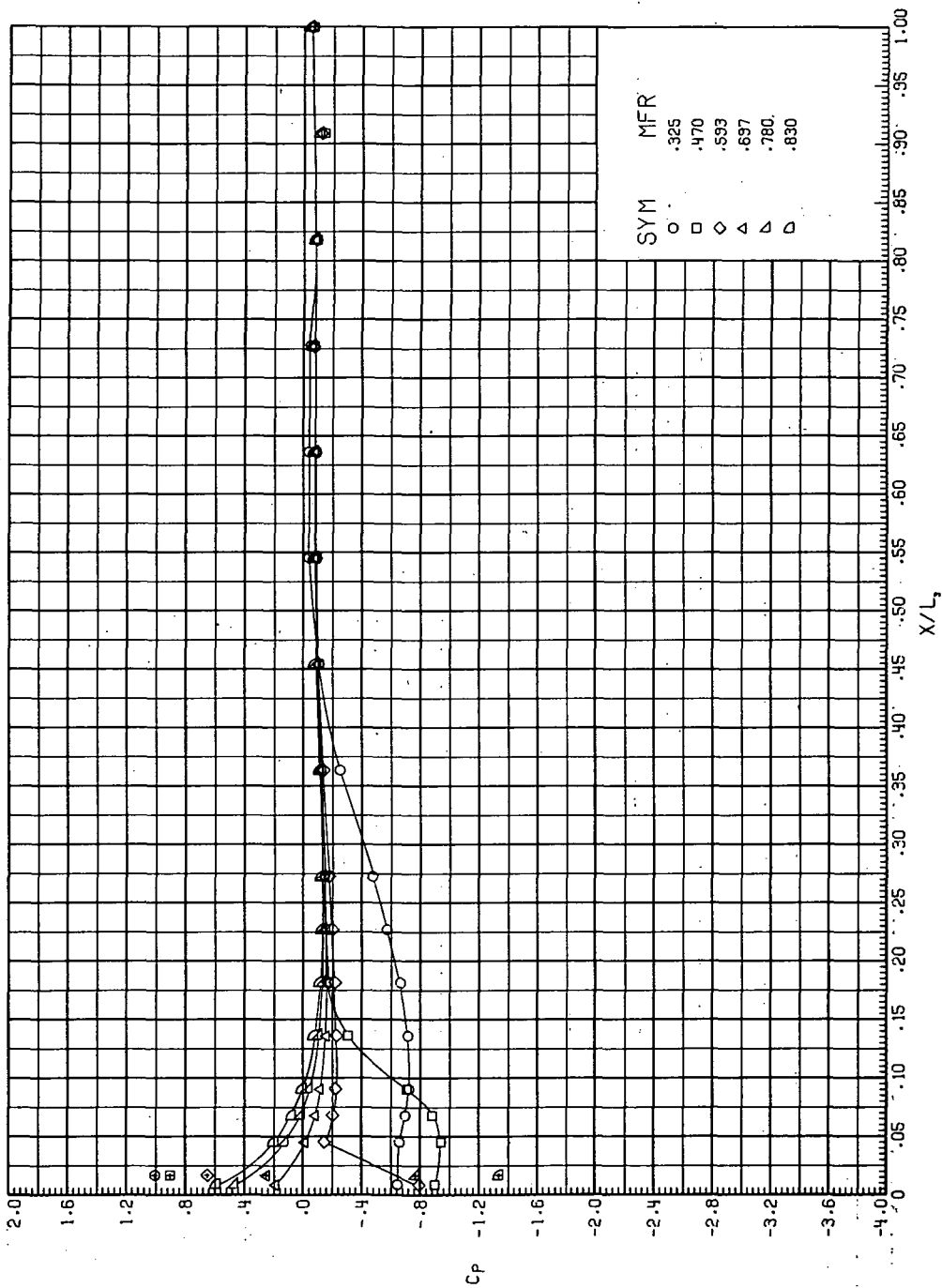
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 32.- Pressure coefficients for cowl 20-0. $\delta_1 = \delta_2 = 5^\circ$.



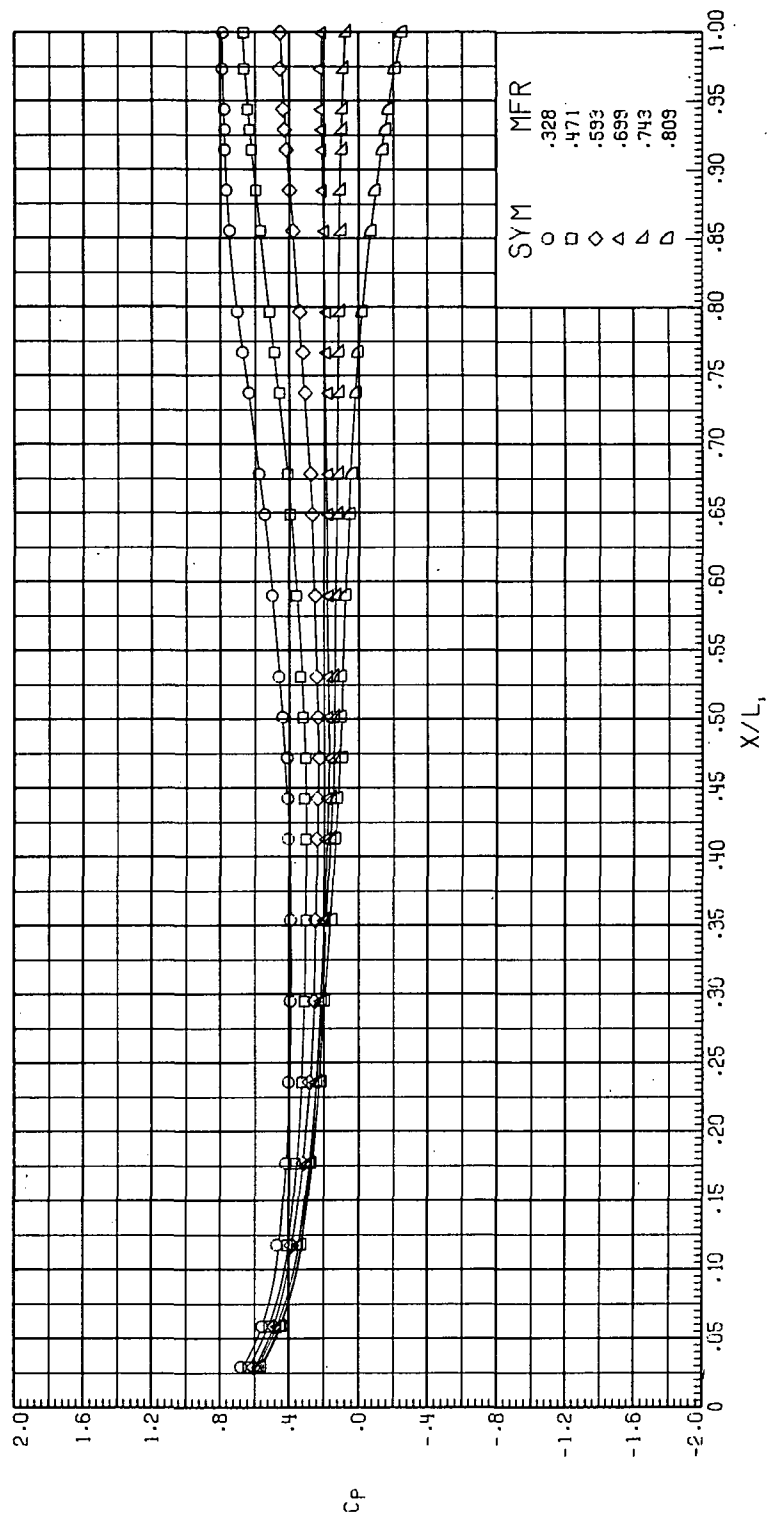
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



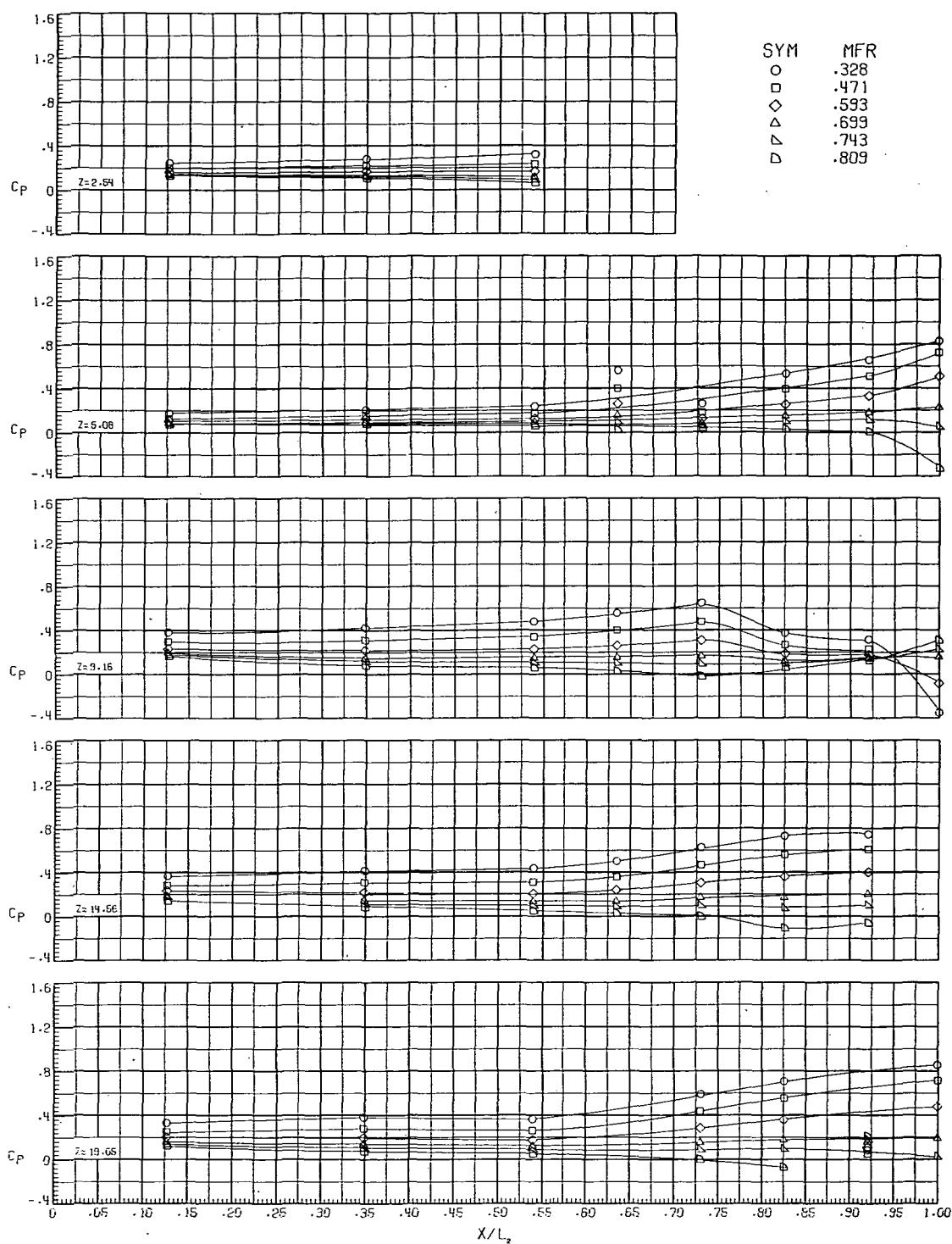
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32. - Continued.



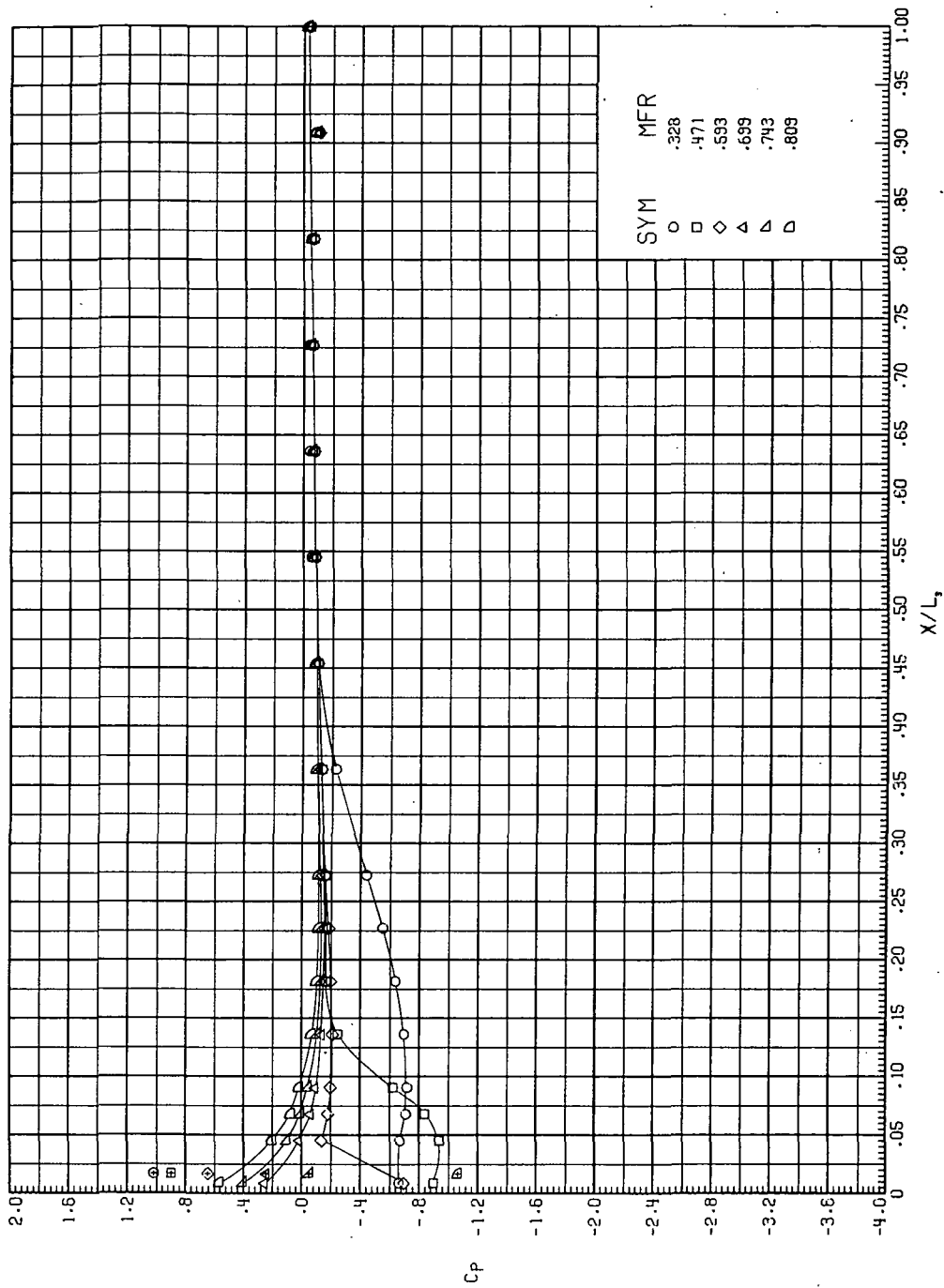
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



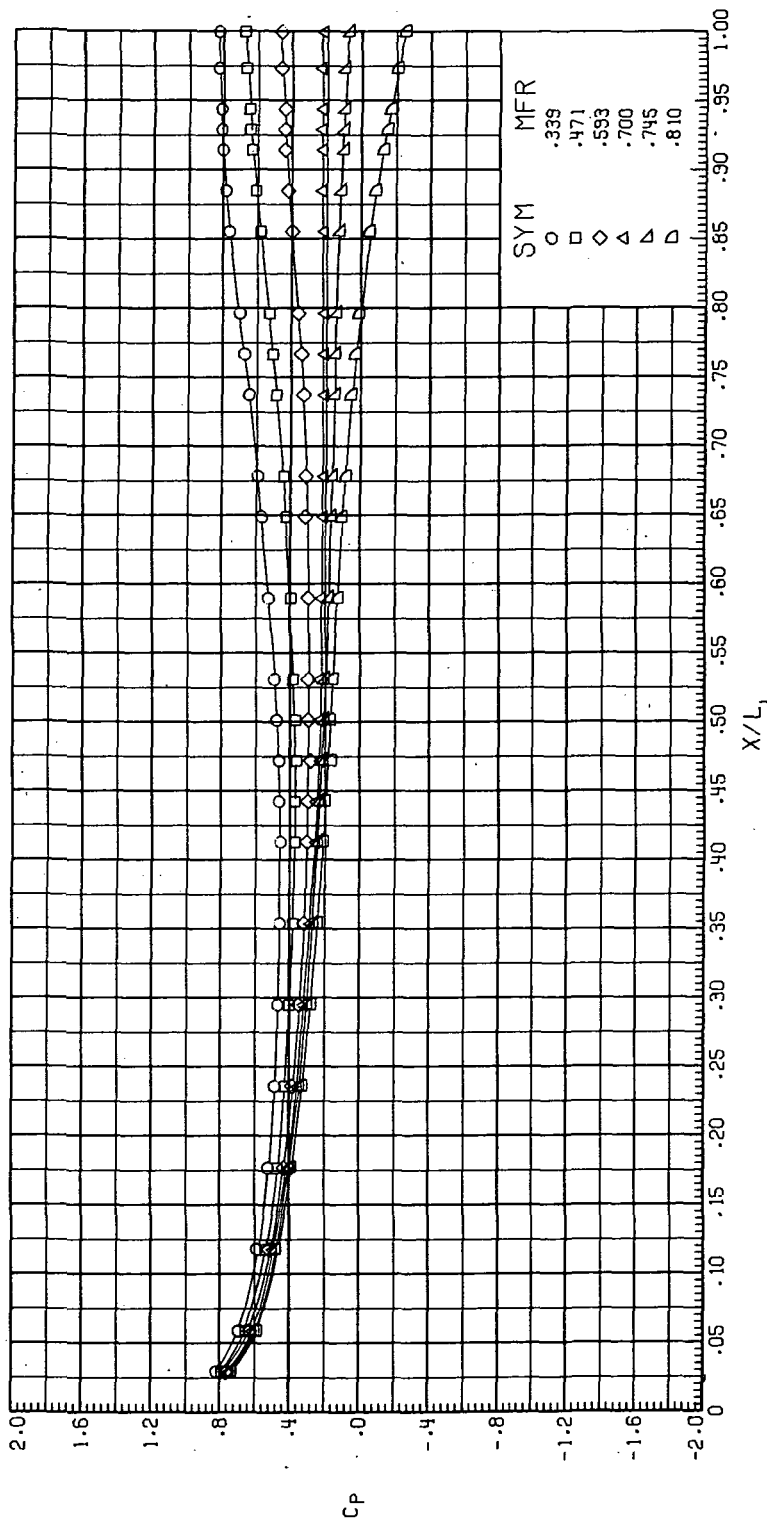
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



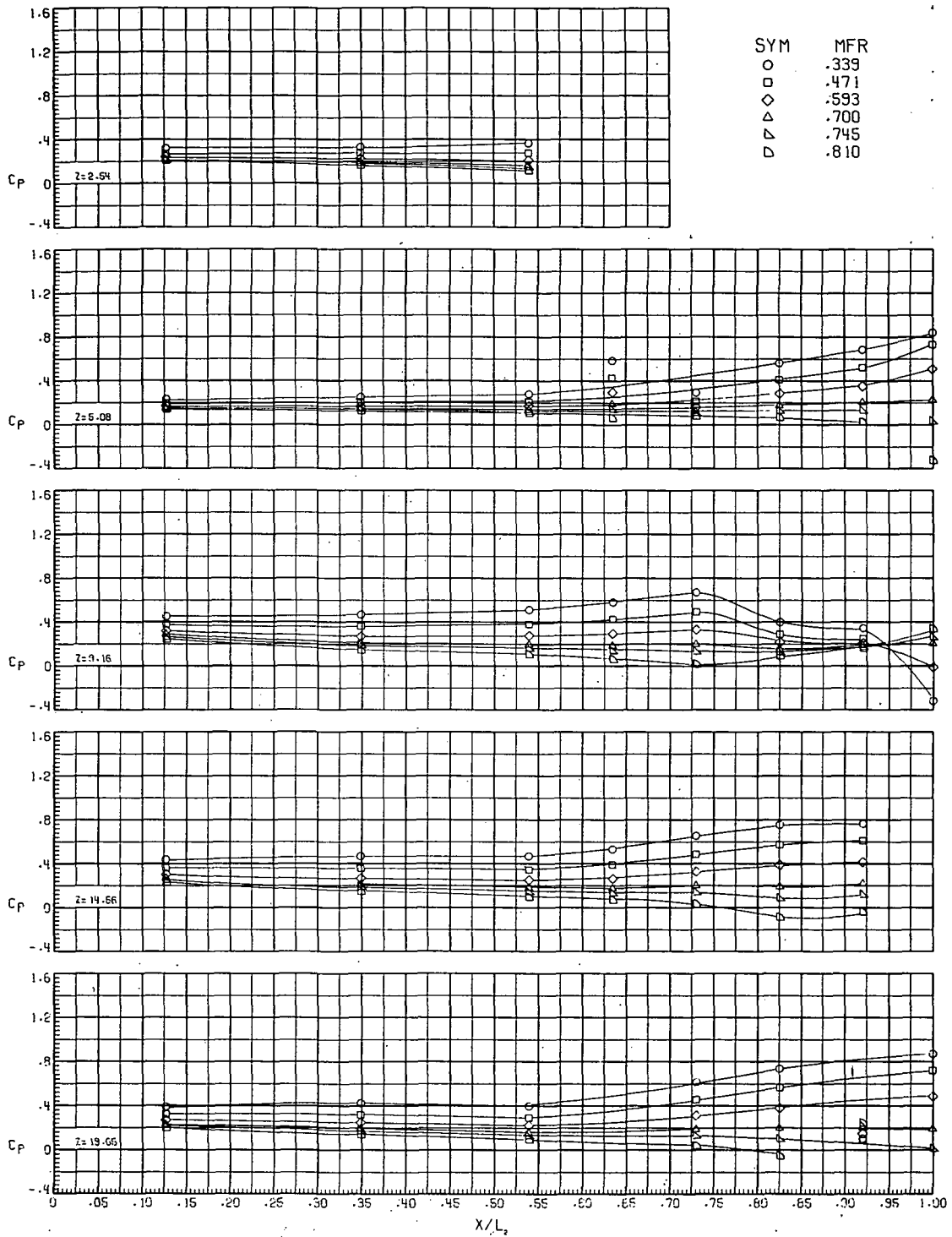
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32. - Continued.



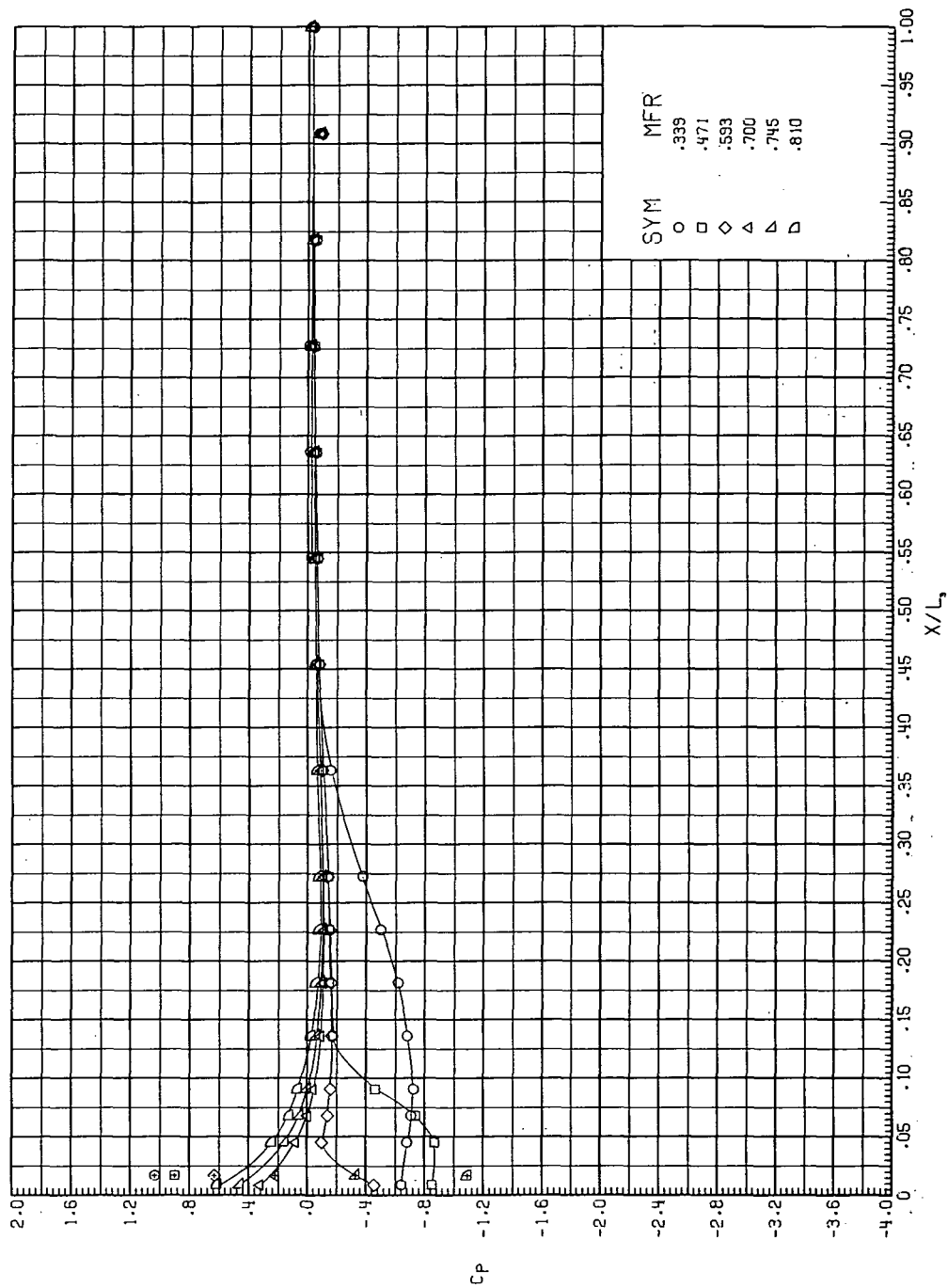
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



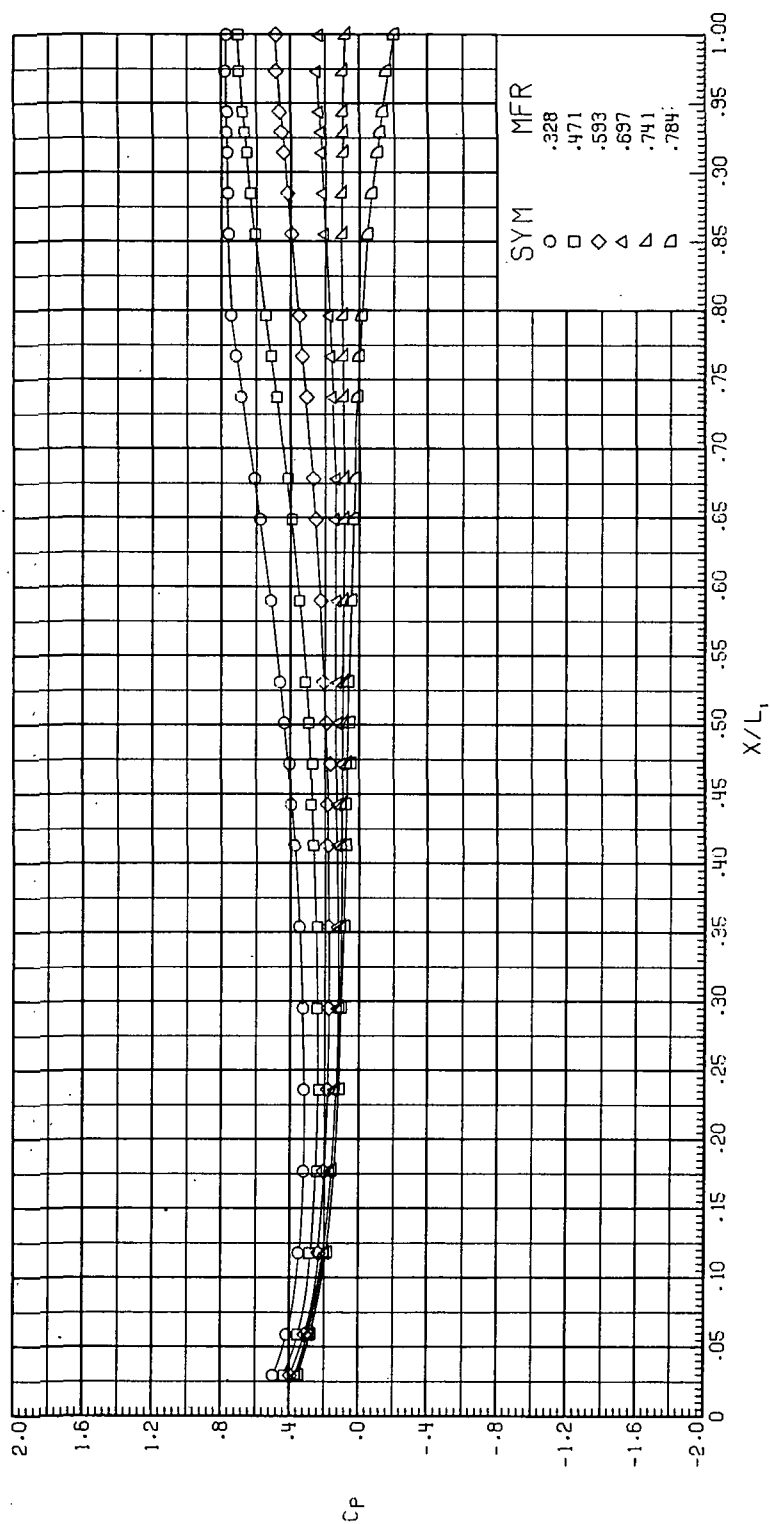
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



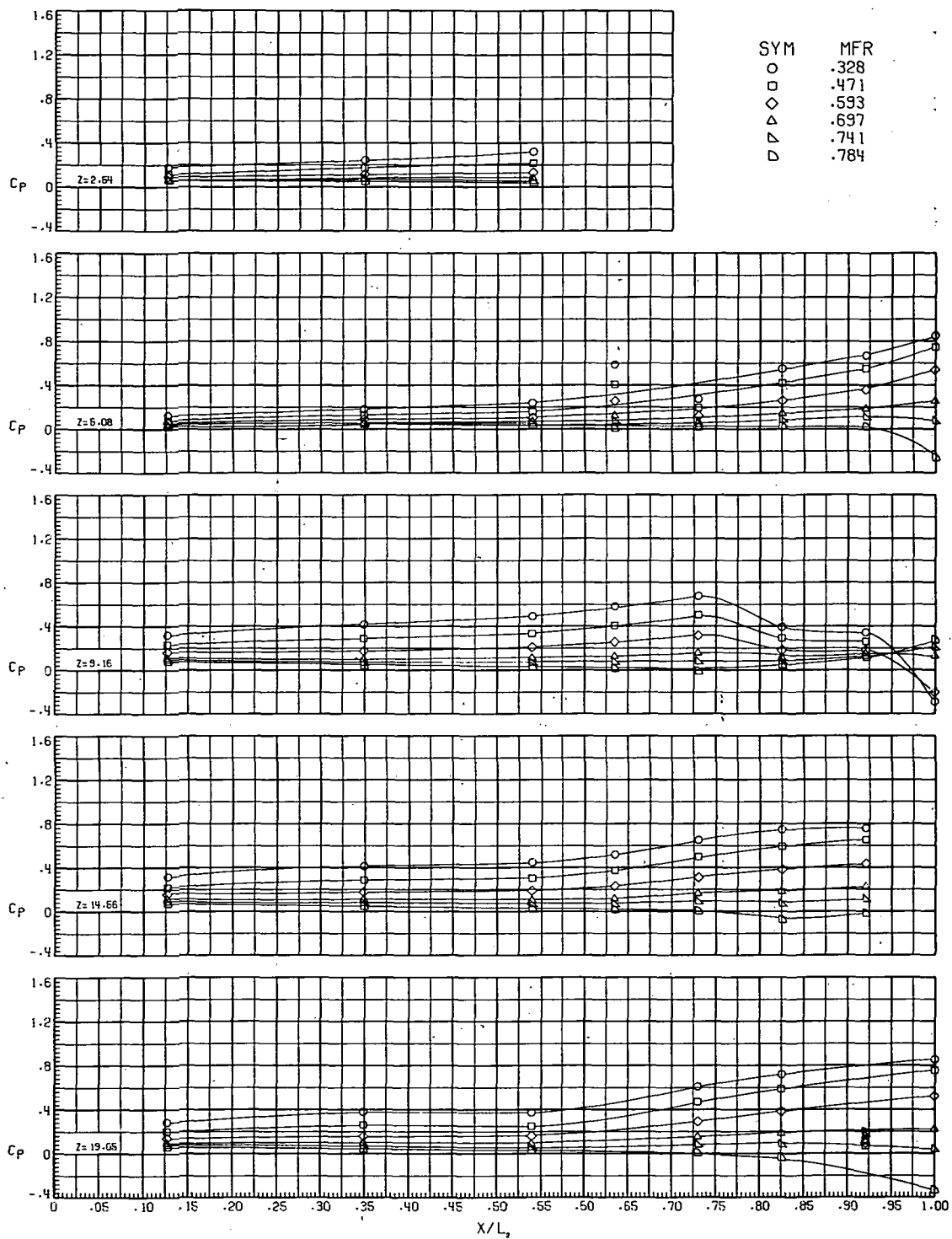
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32.- Continued.



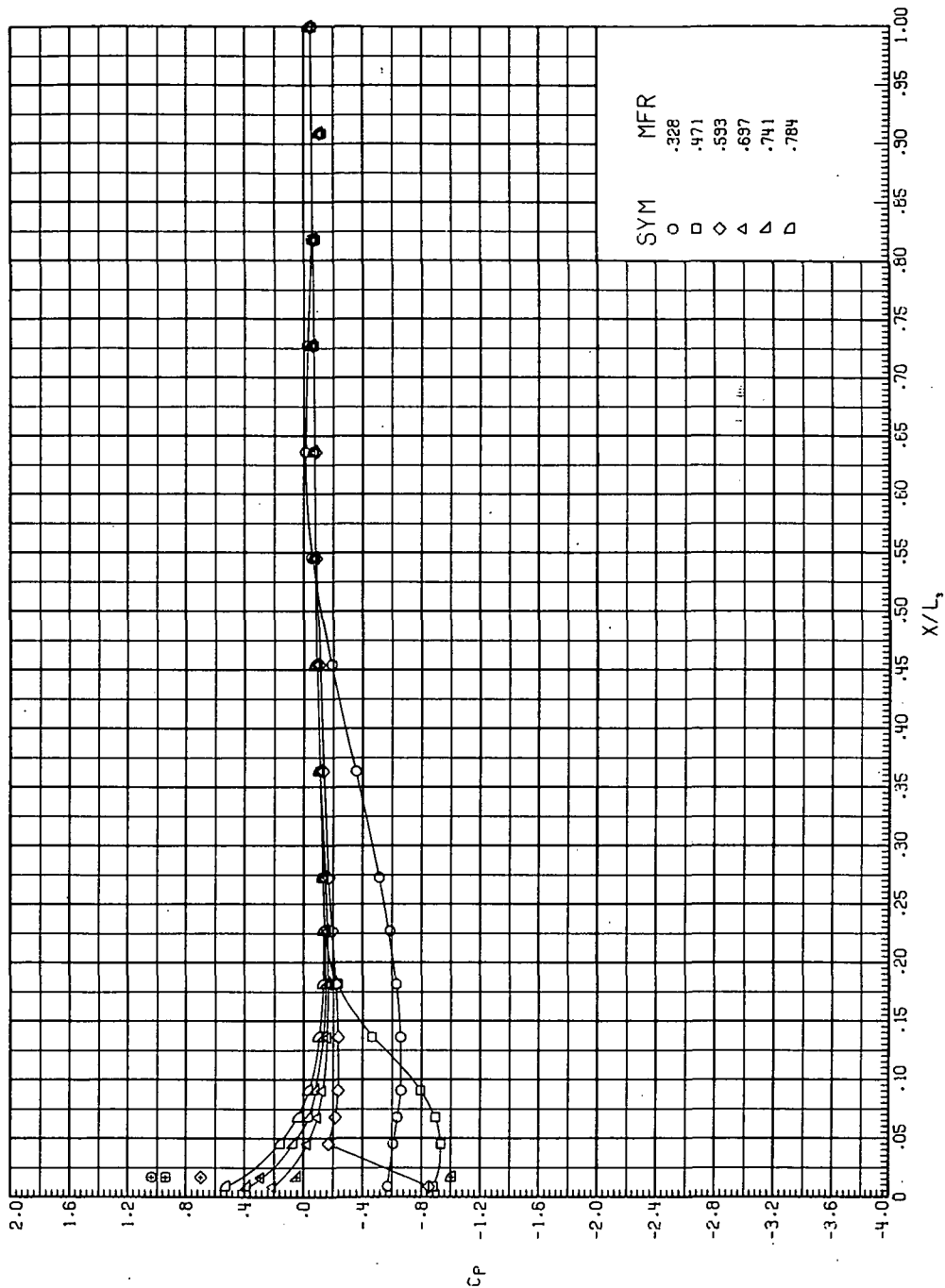
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 32. - Continued.



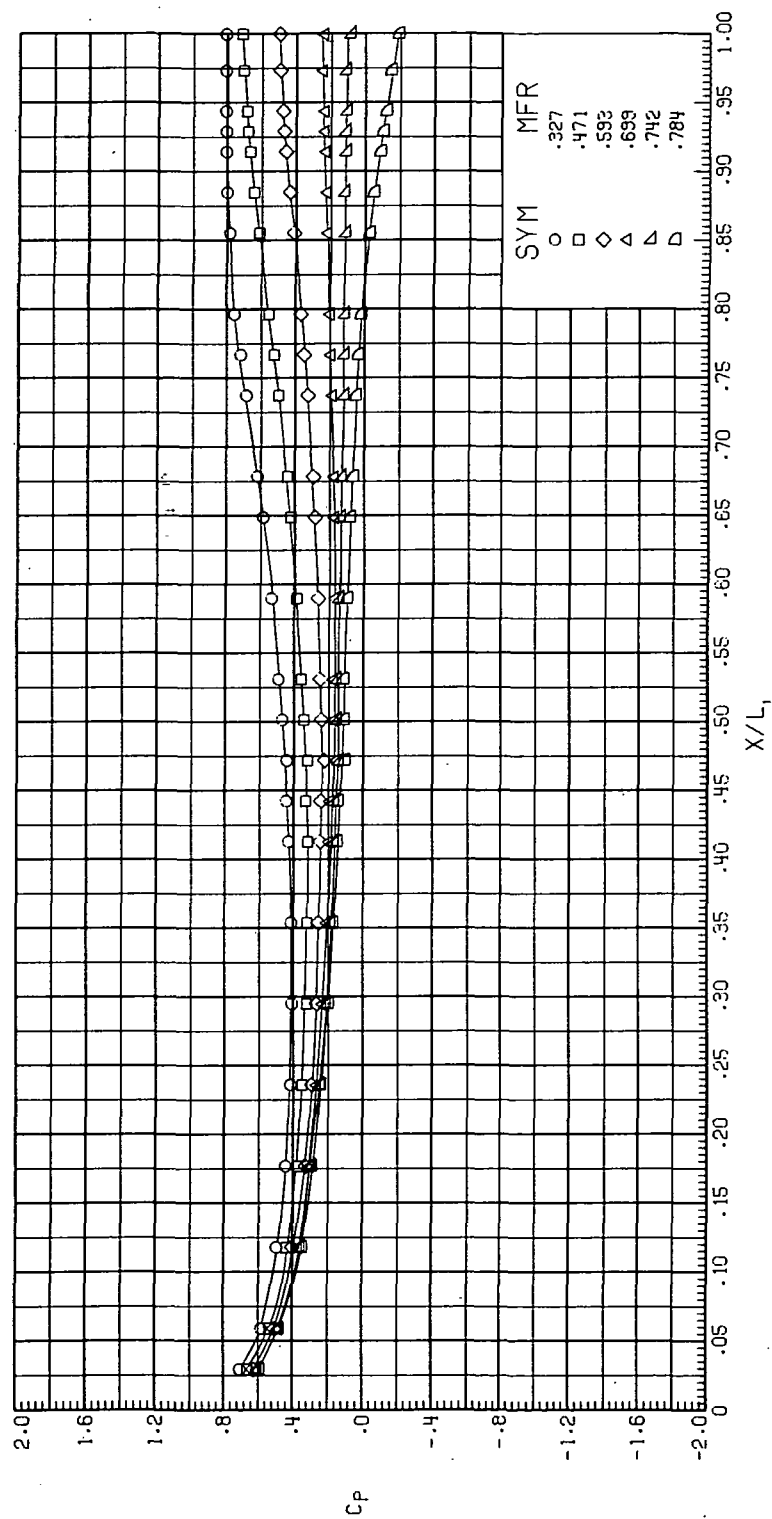
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



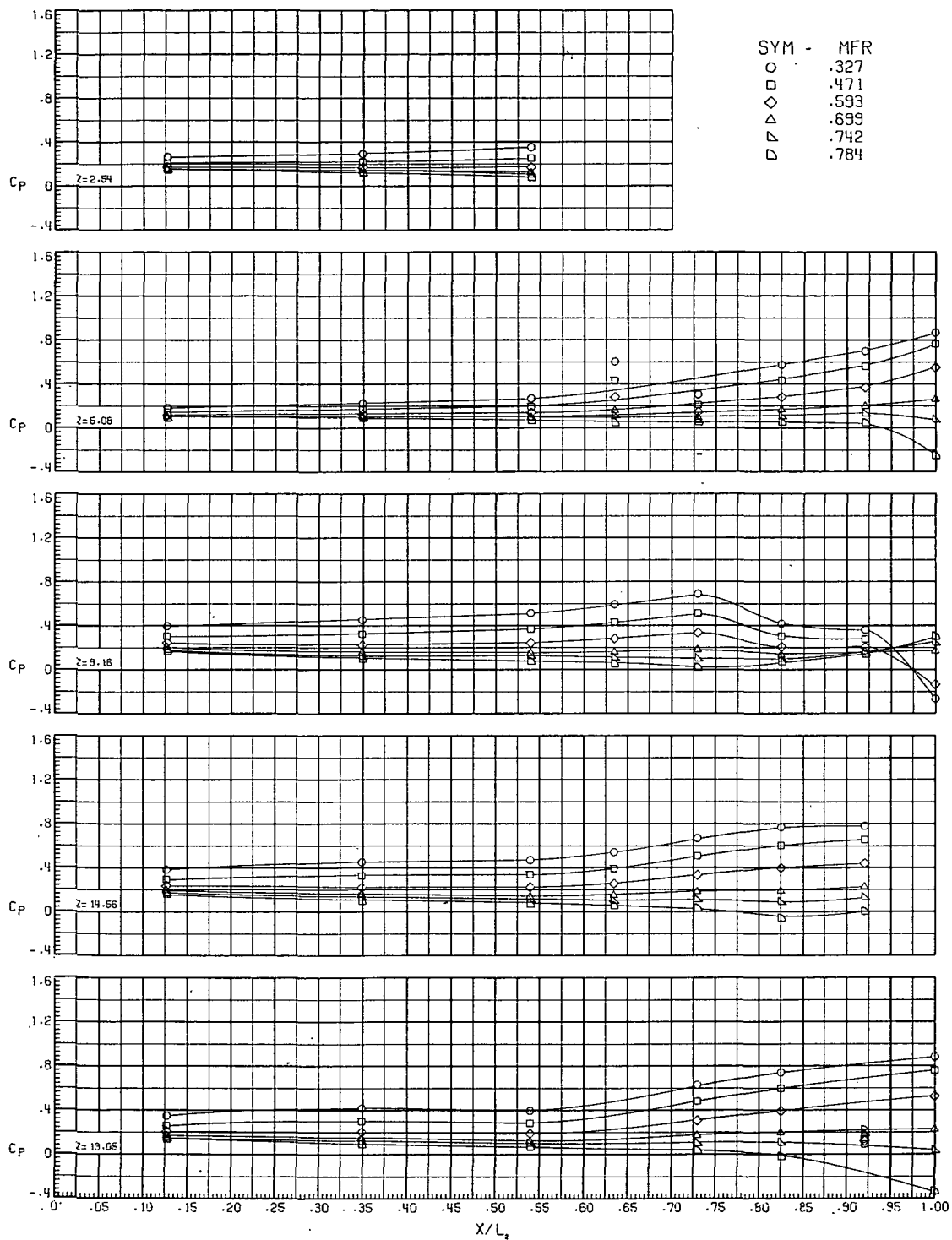
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32. - Continued.



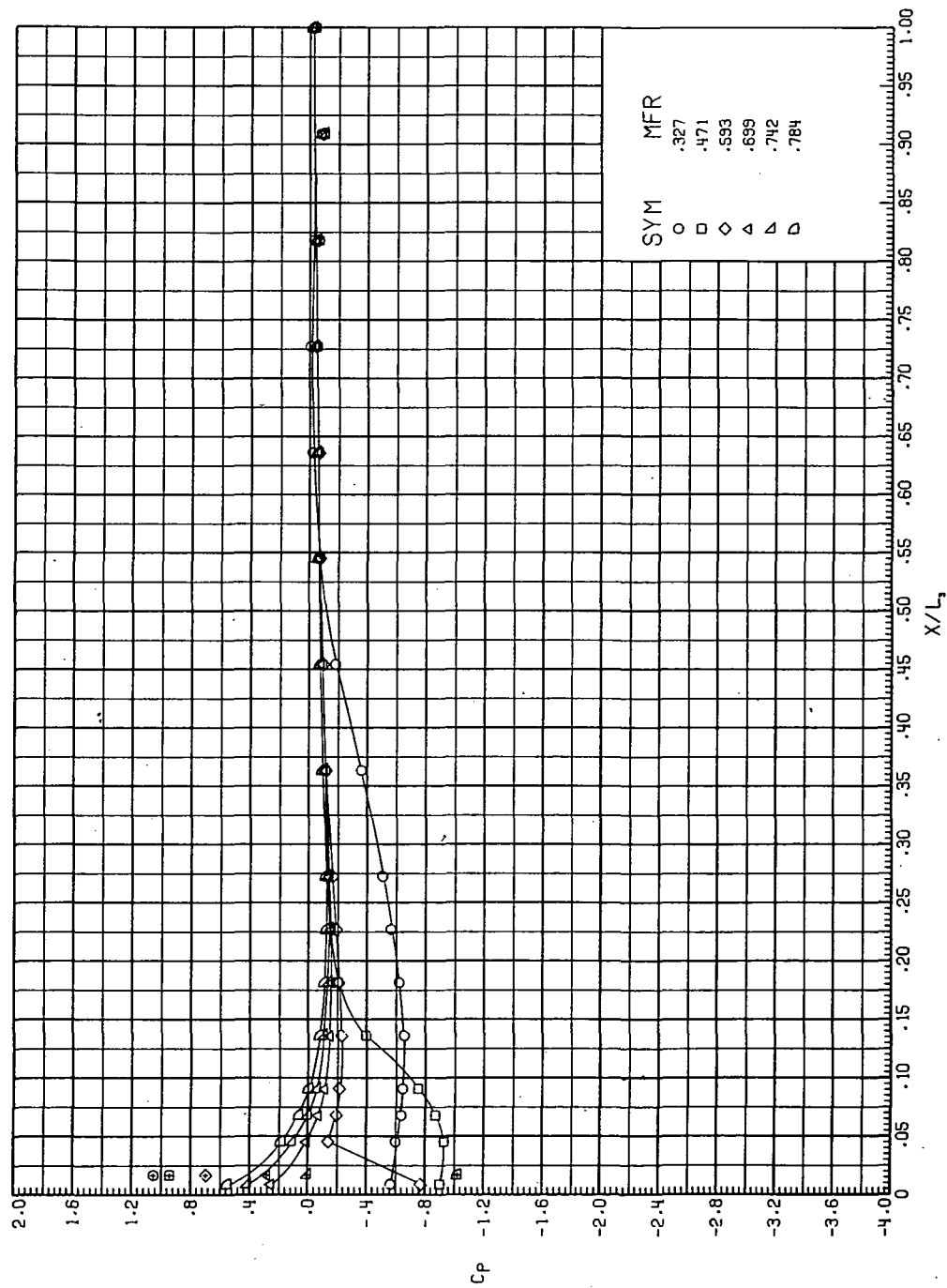
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



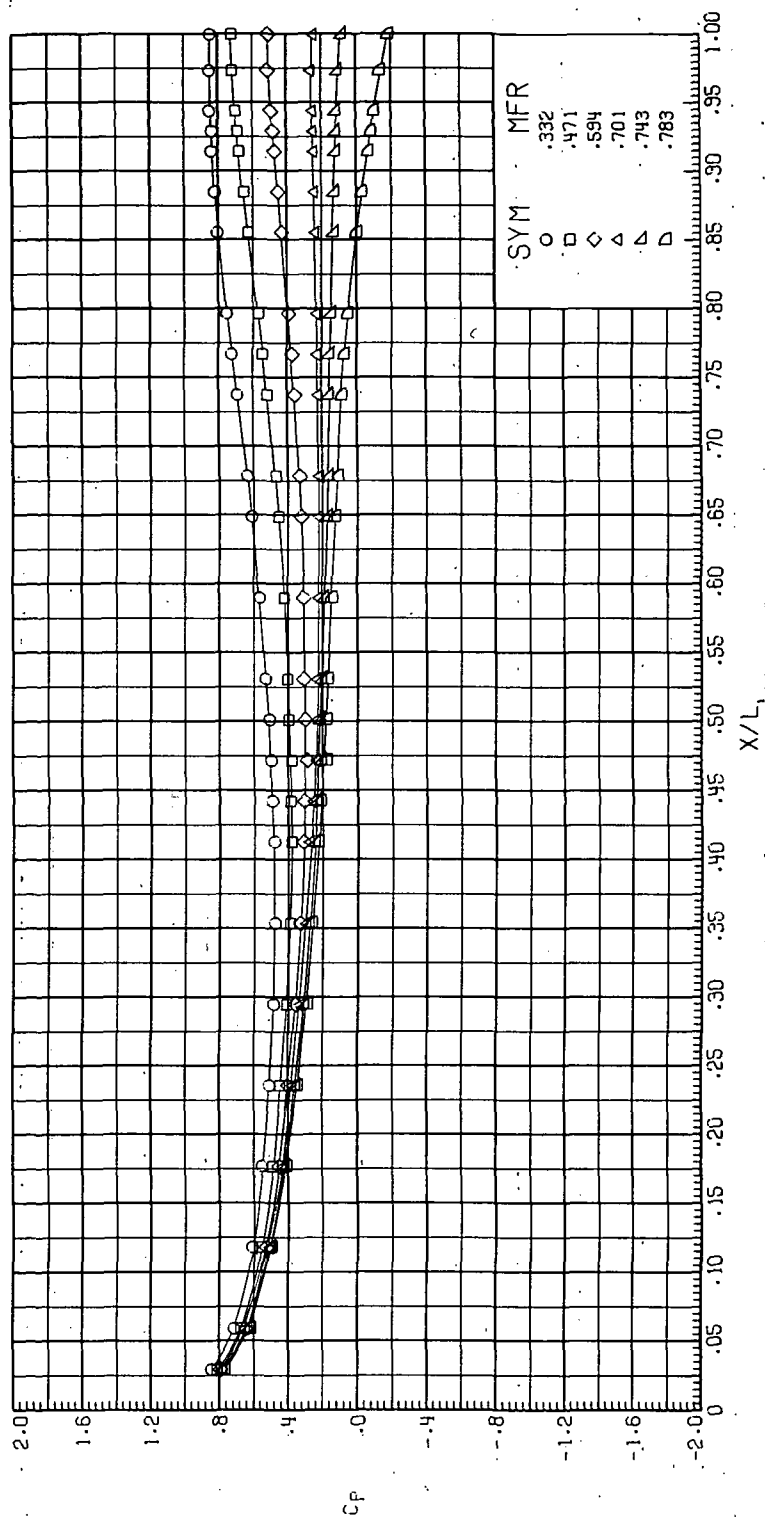
(e) $M = 0.7$; $\alpha = 40^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



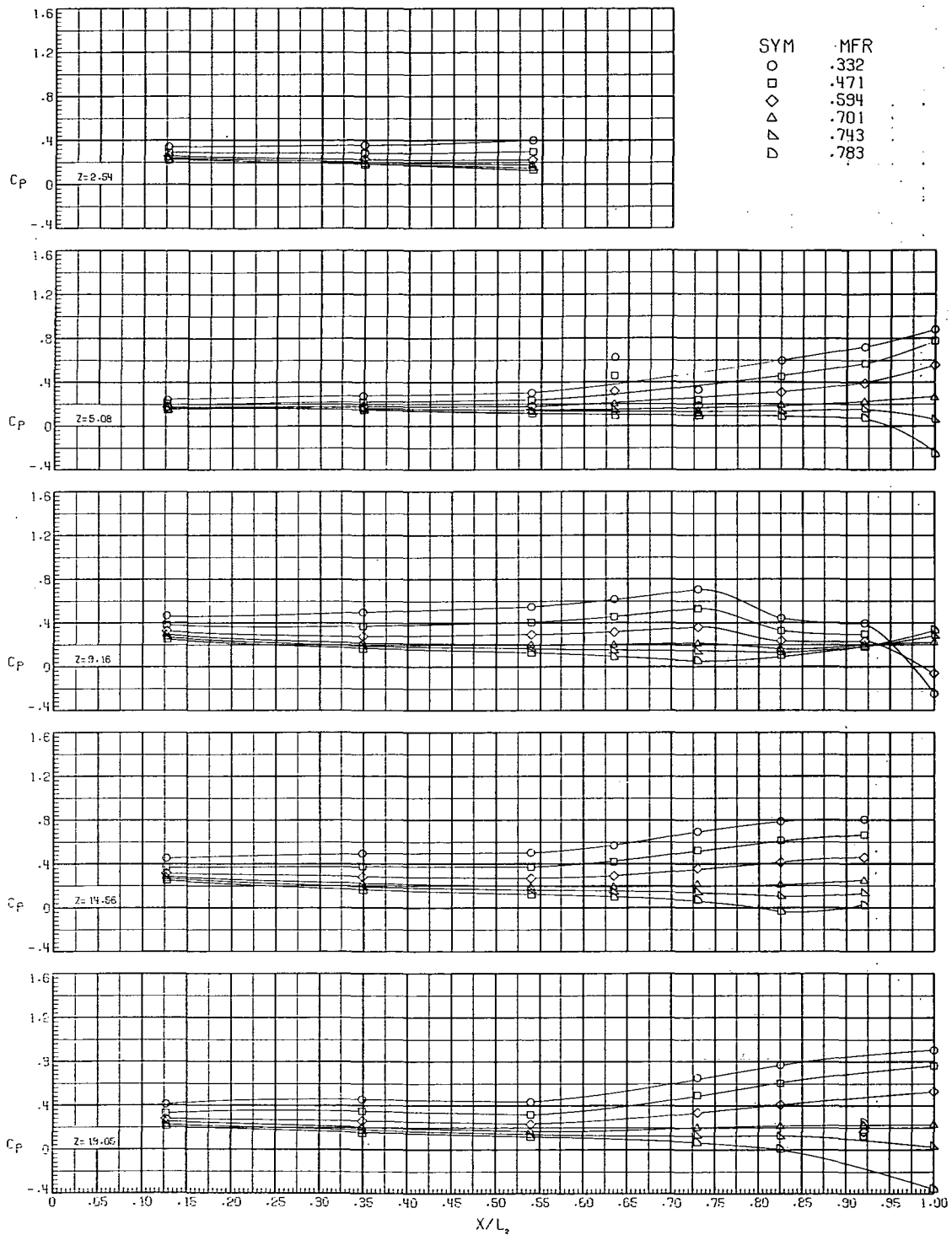
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32.- Continued.



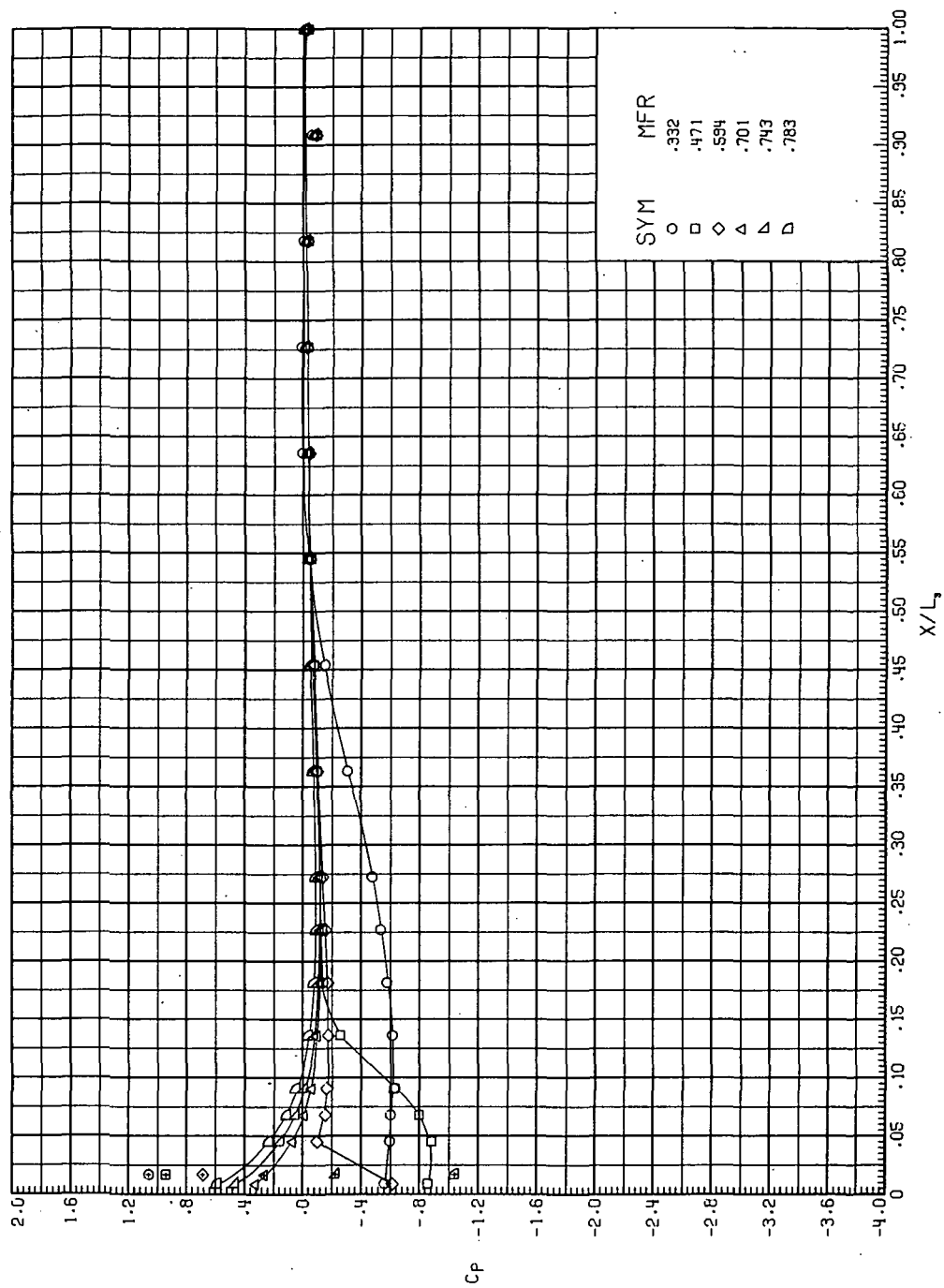
(f) $M = 0.7$; $\alpha = 80^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



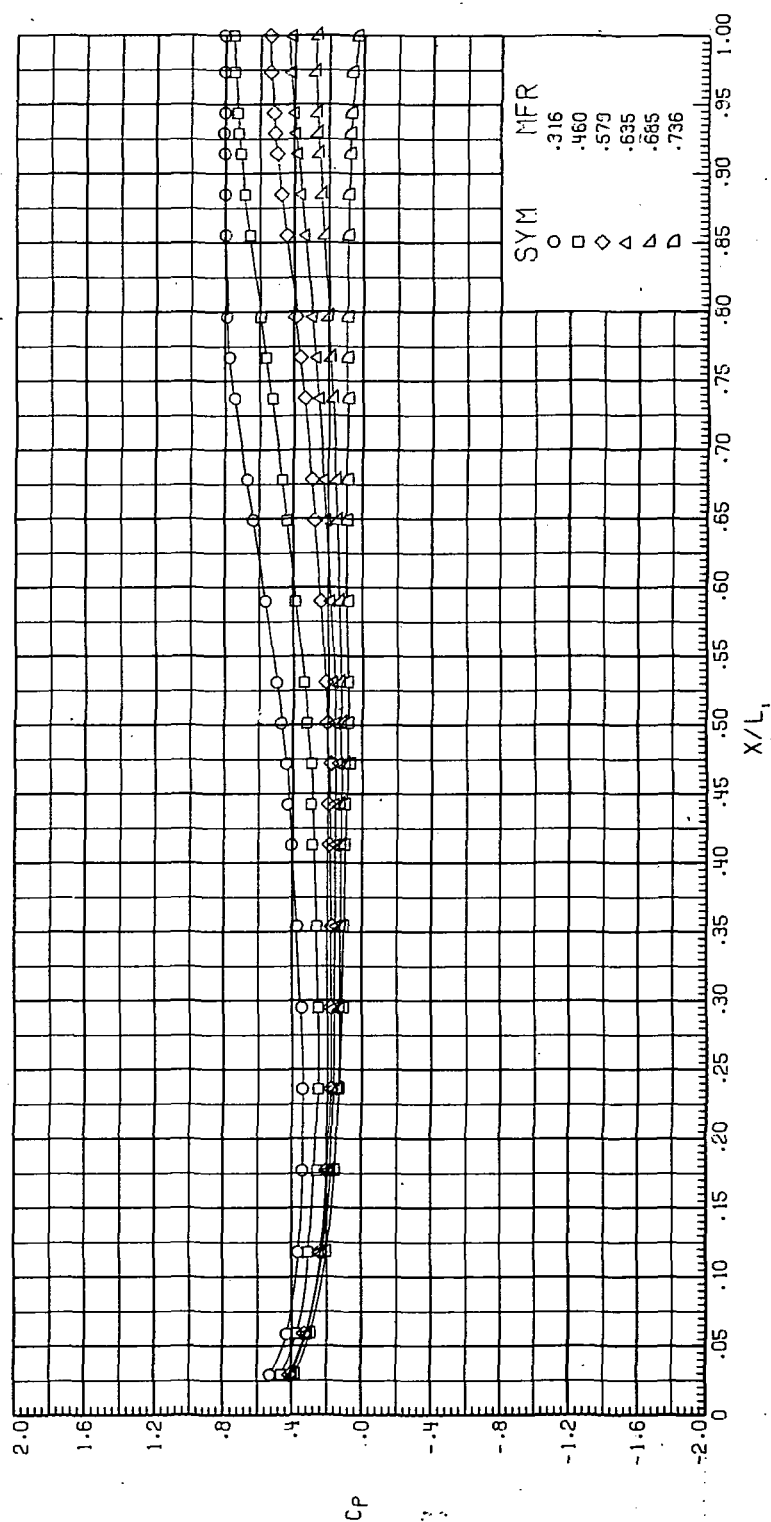
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



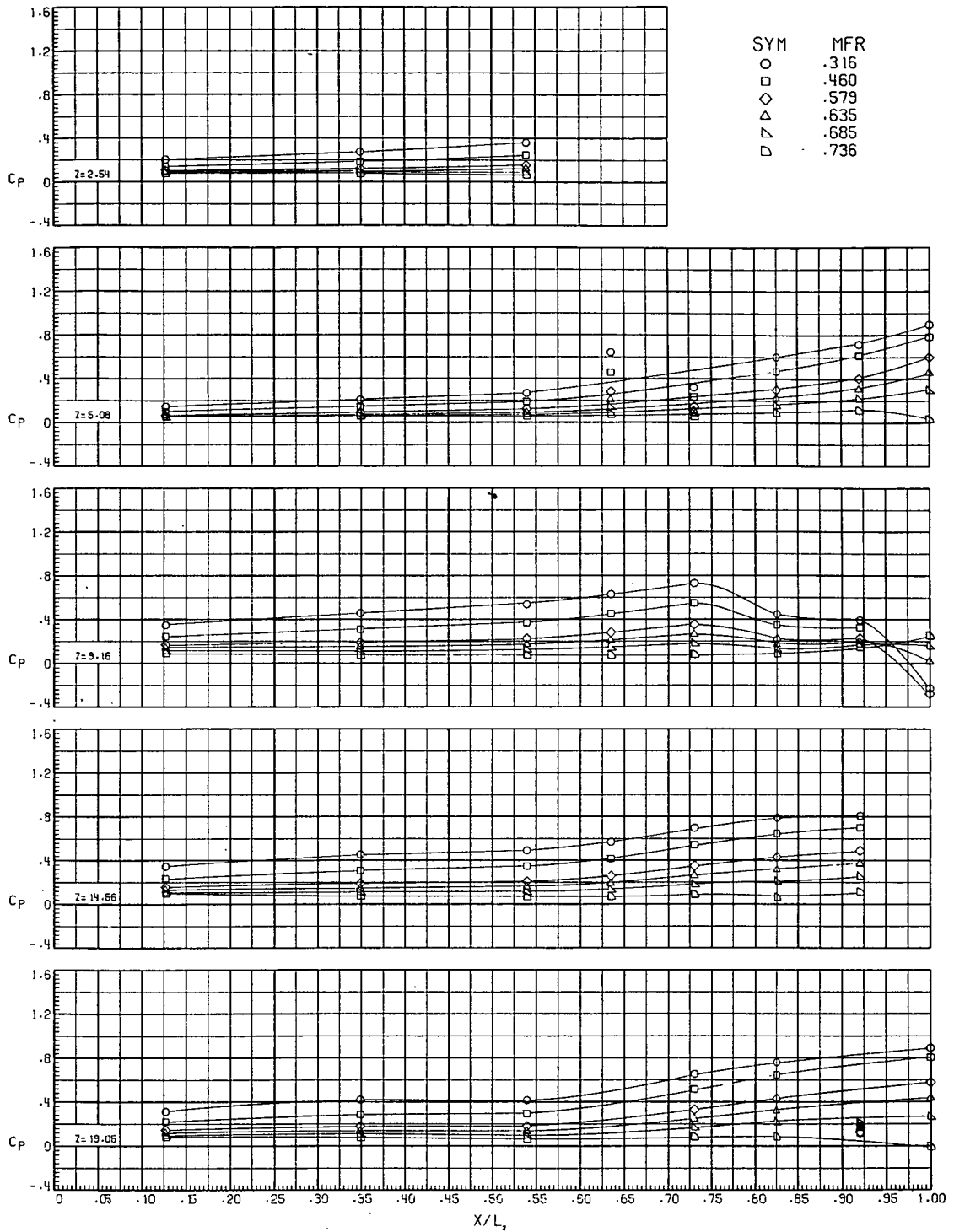
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32.- Continued.



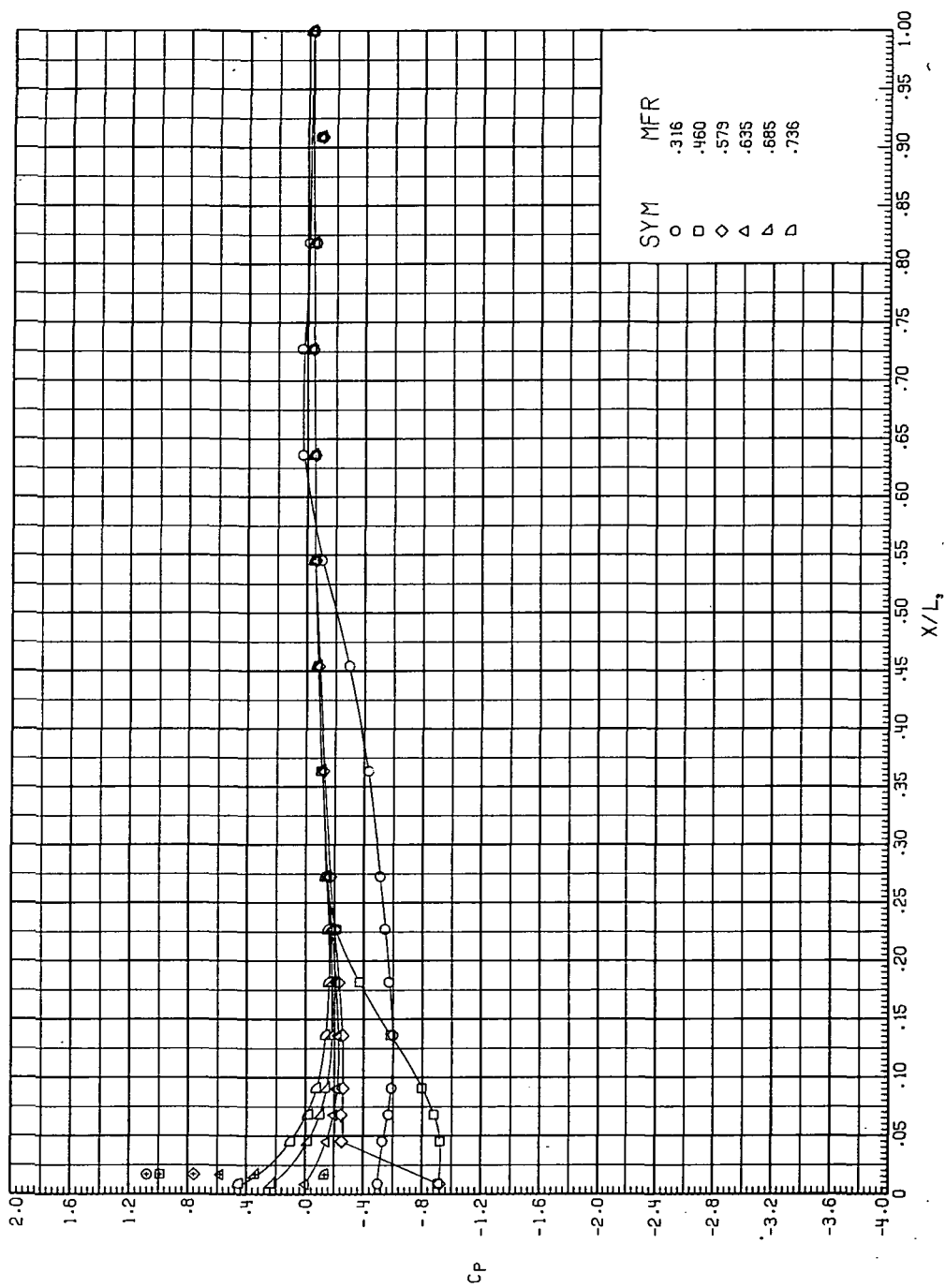
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



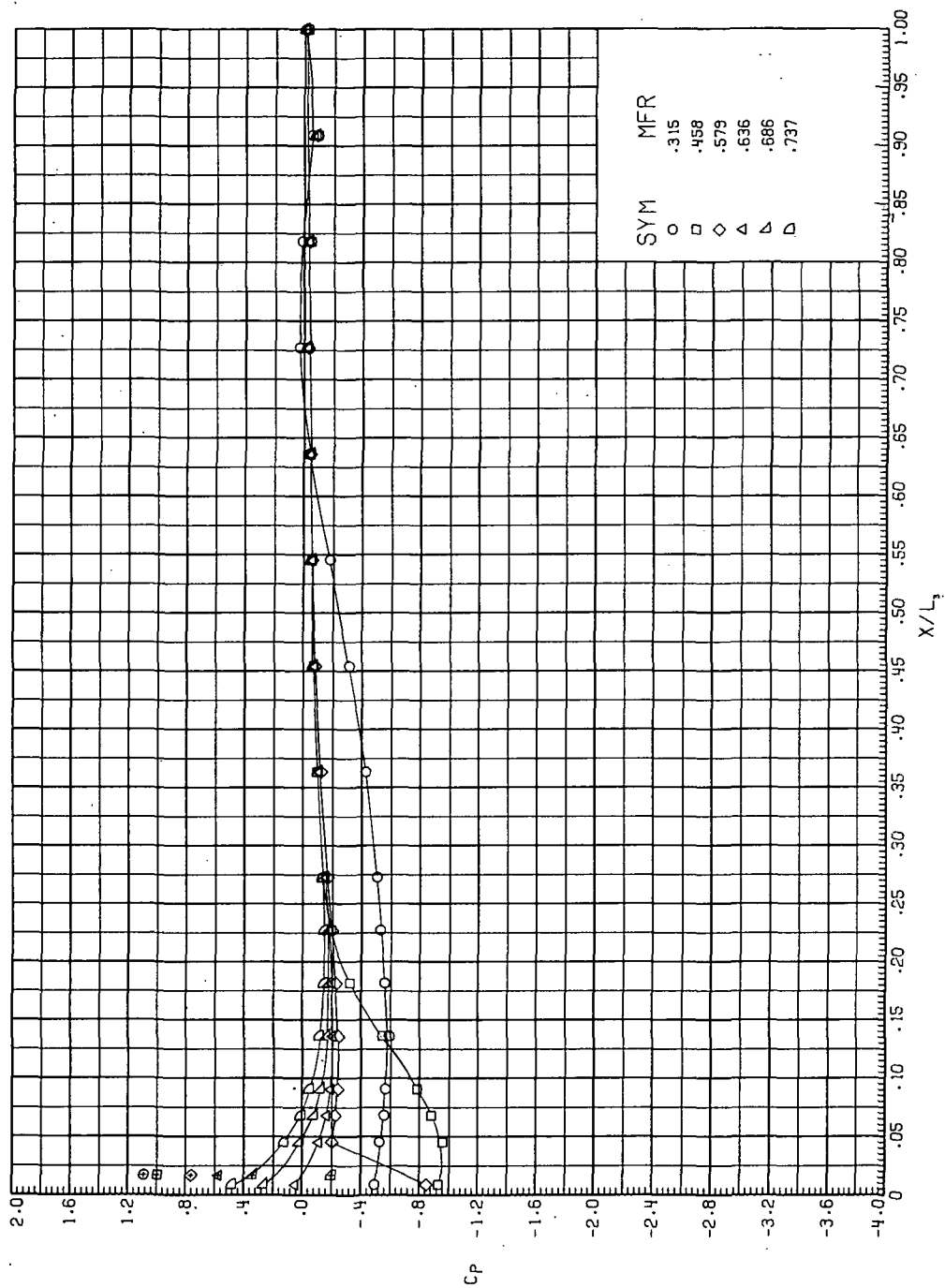
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



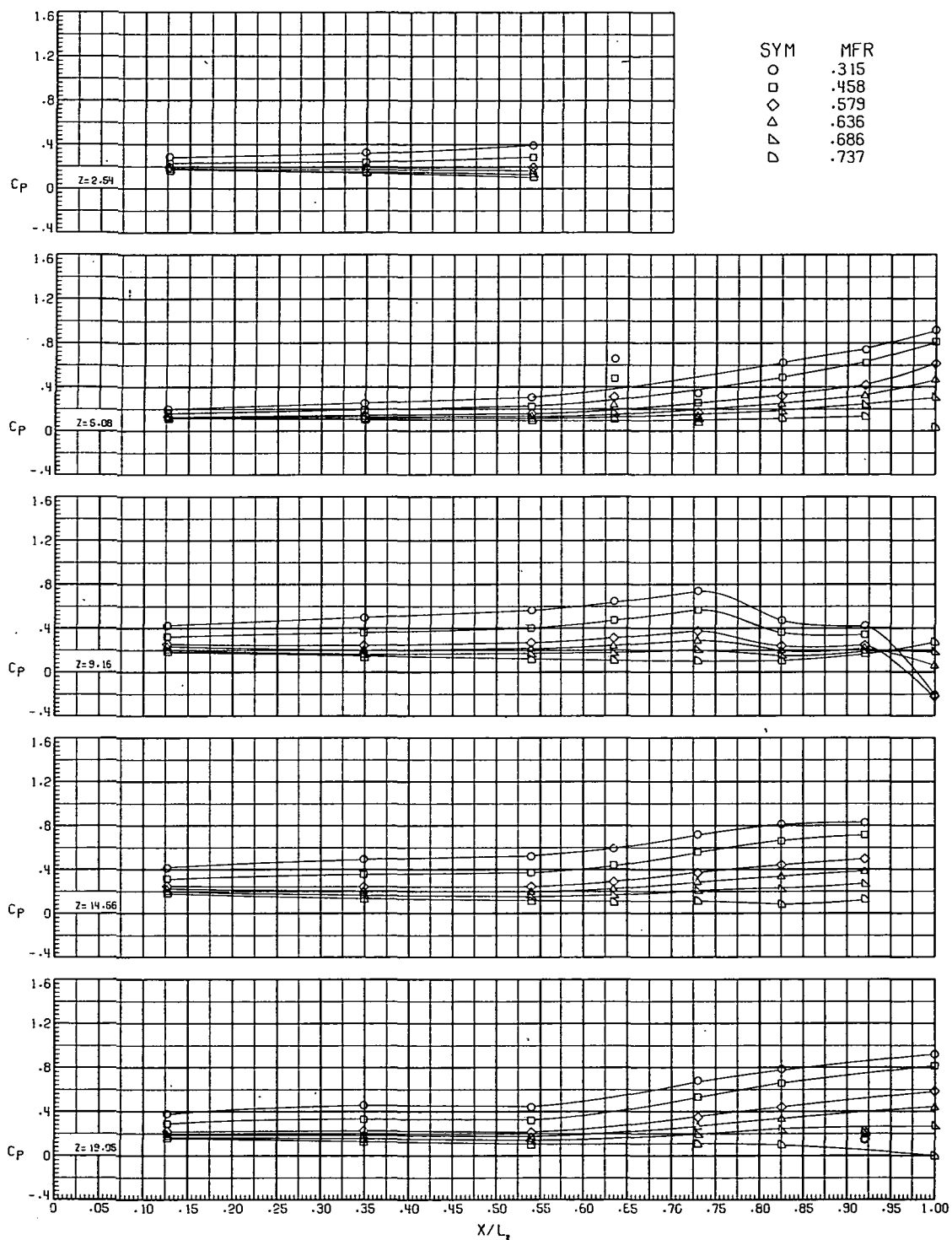
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32.- Continued.



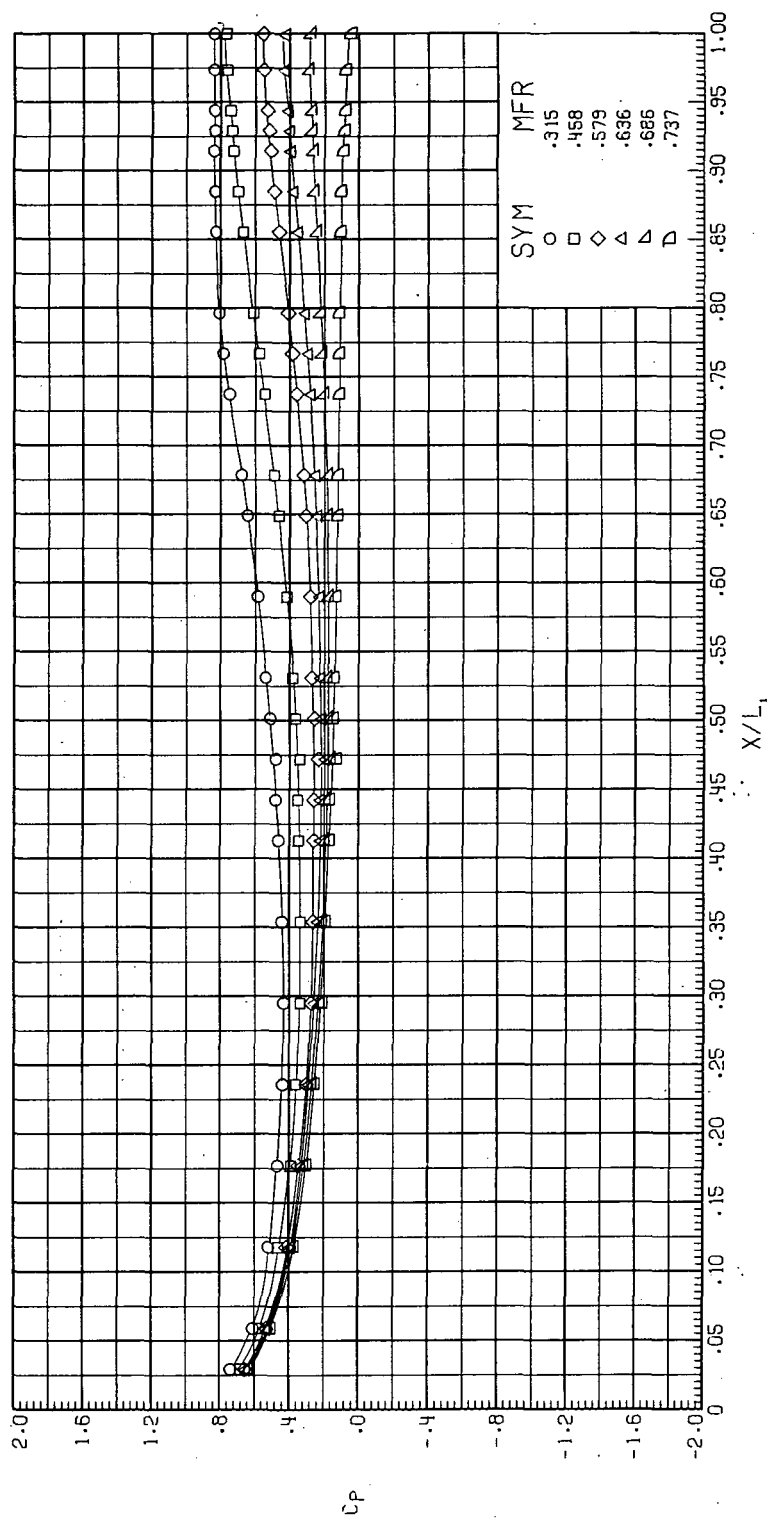
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 32.- Continued.



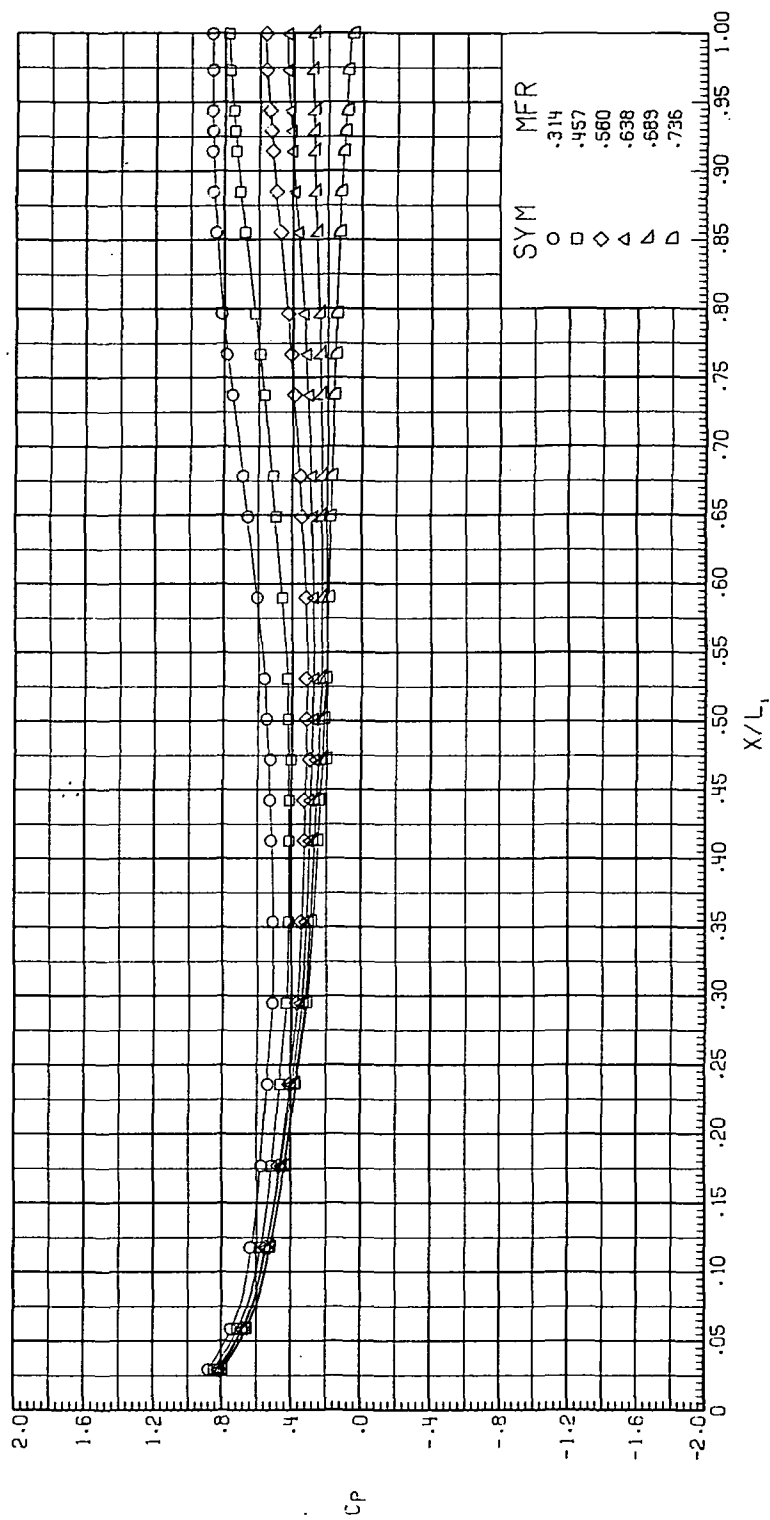
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



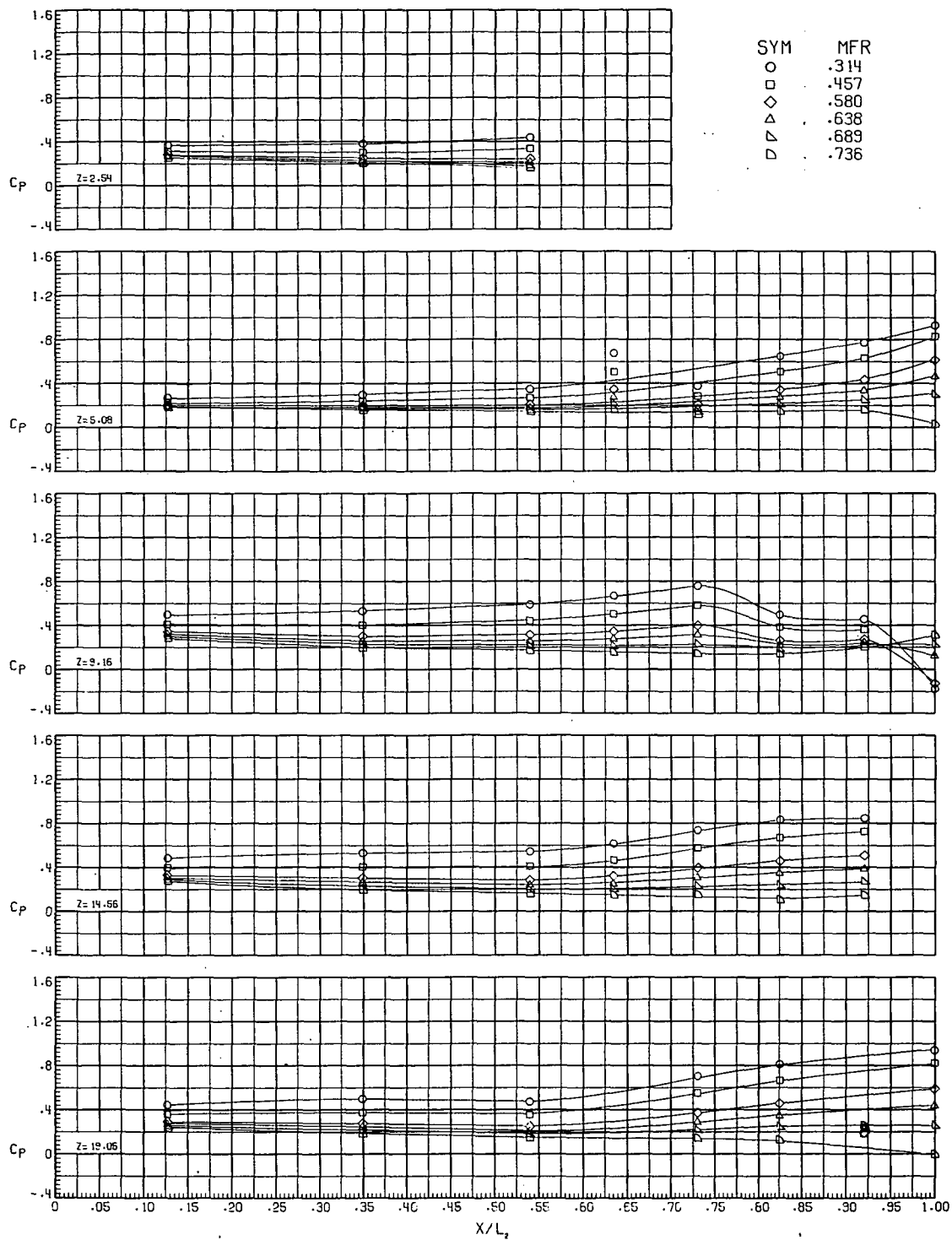
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32. - Continued.



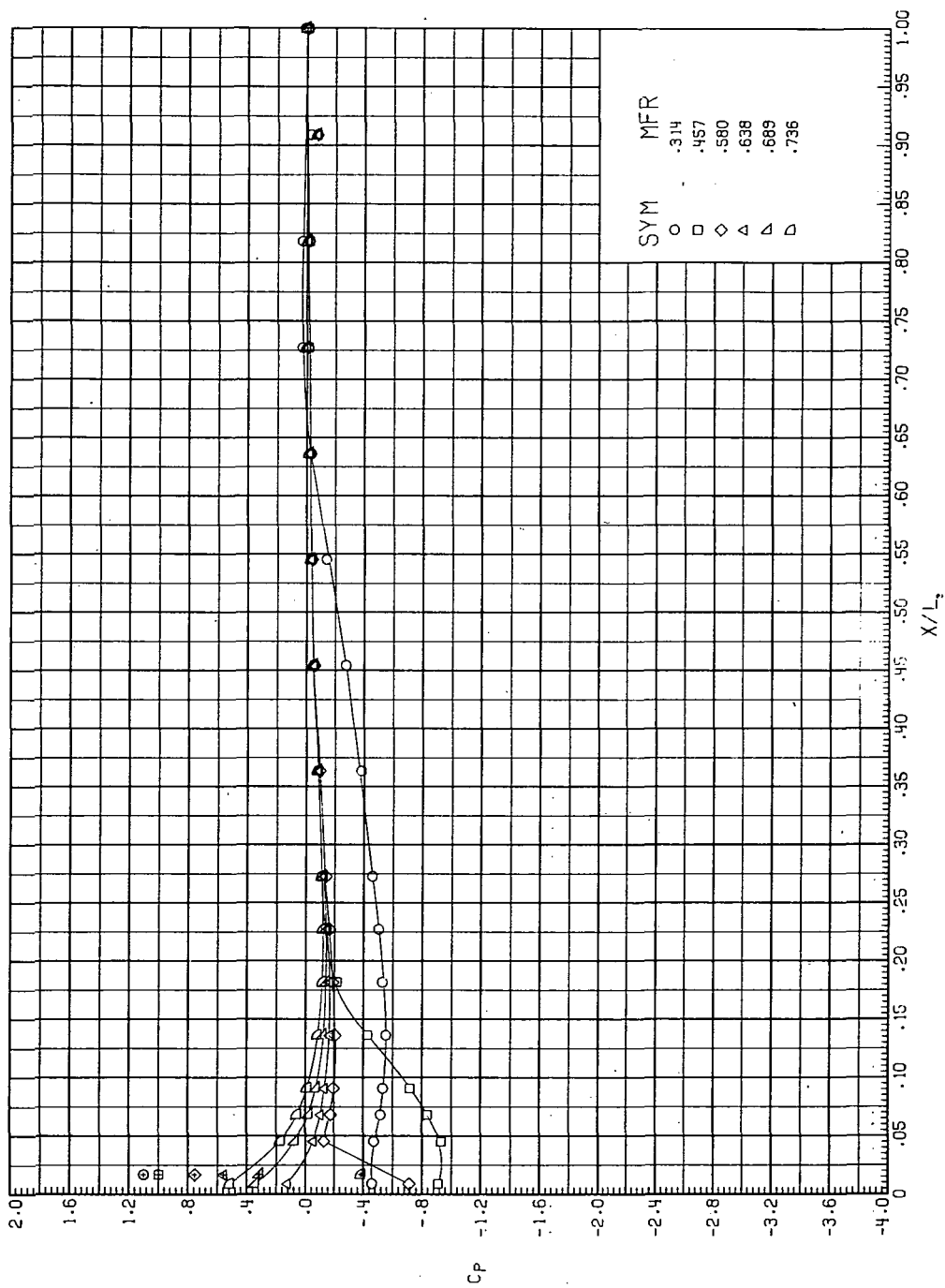
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 32. - Continued.



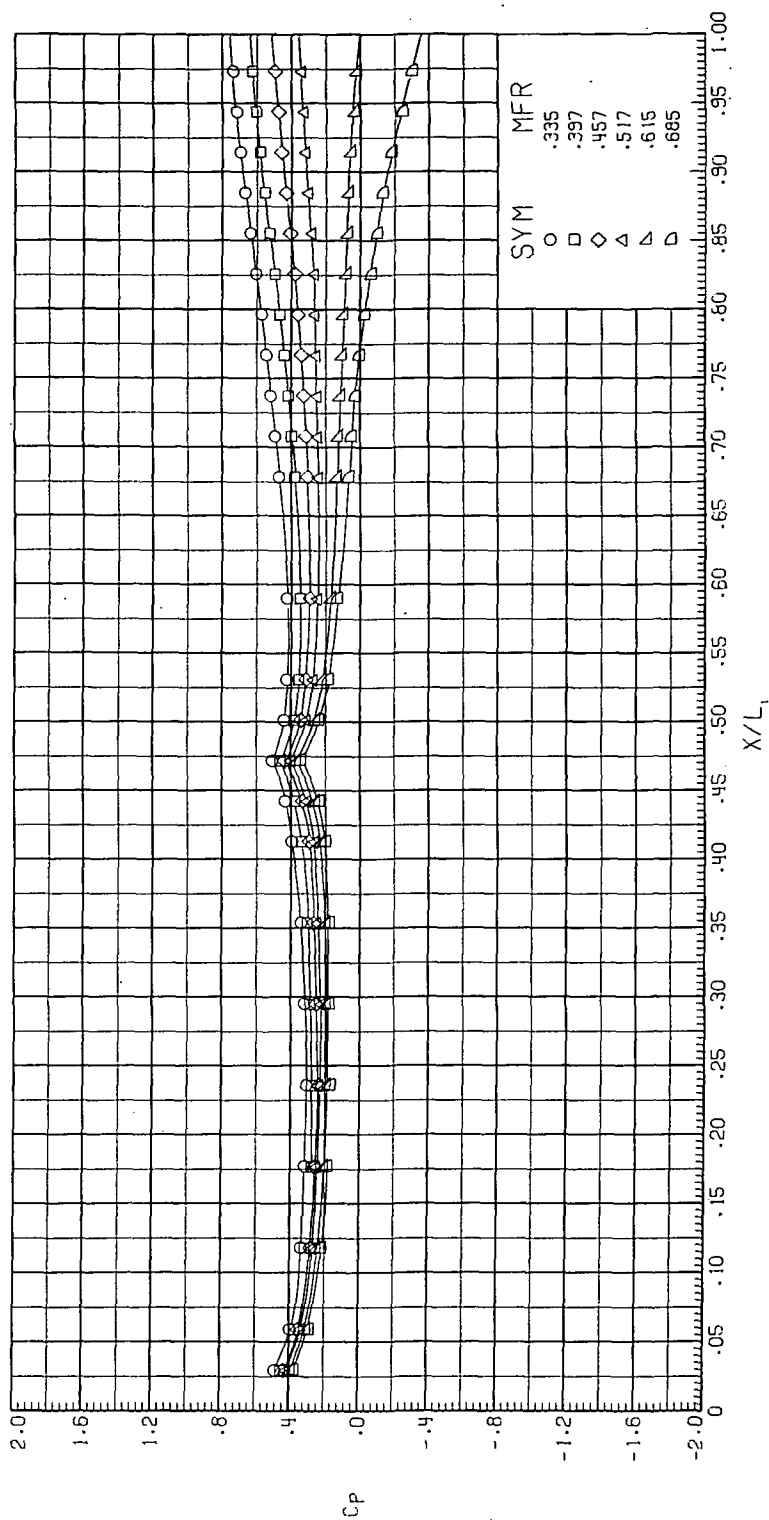
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 32.- Continued.



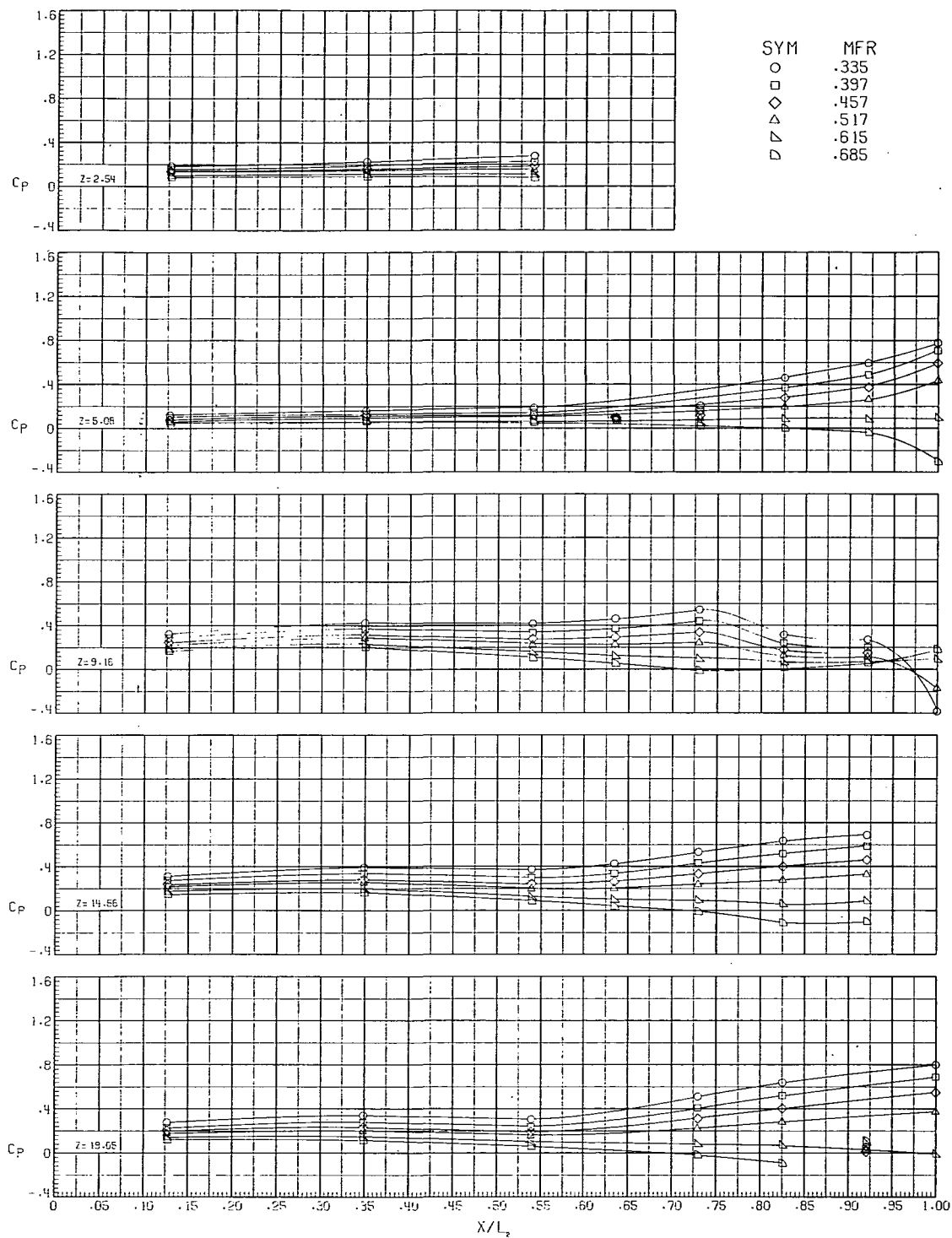
(i) $M = 0.8$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 32.- Concluded.



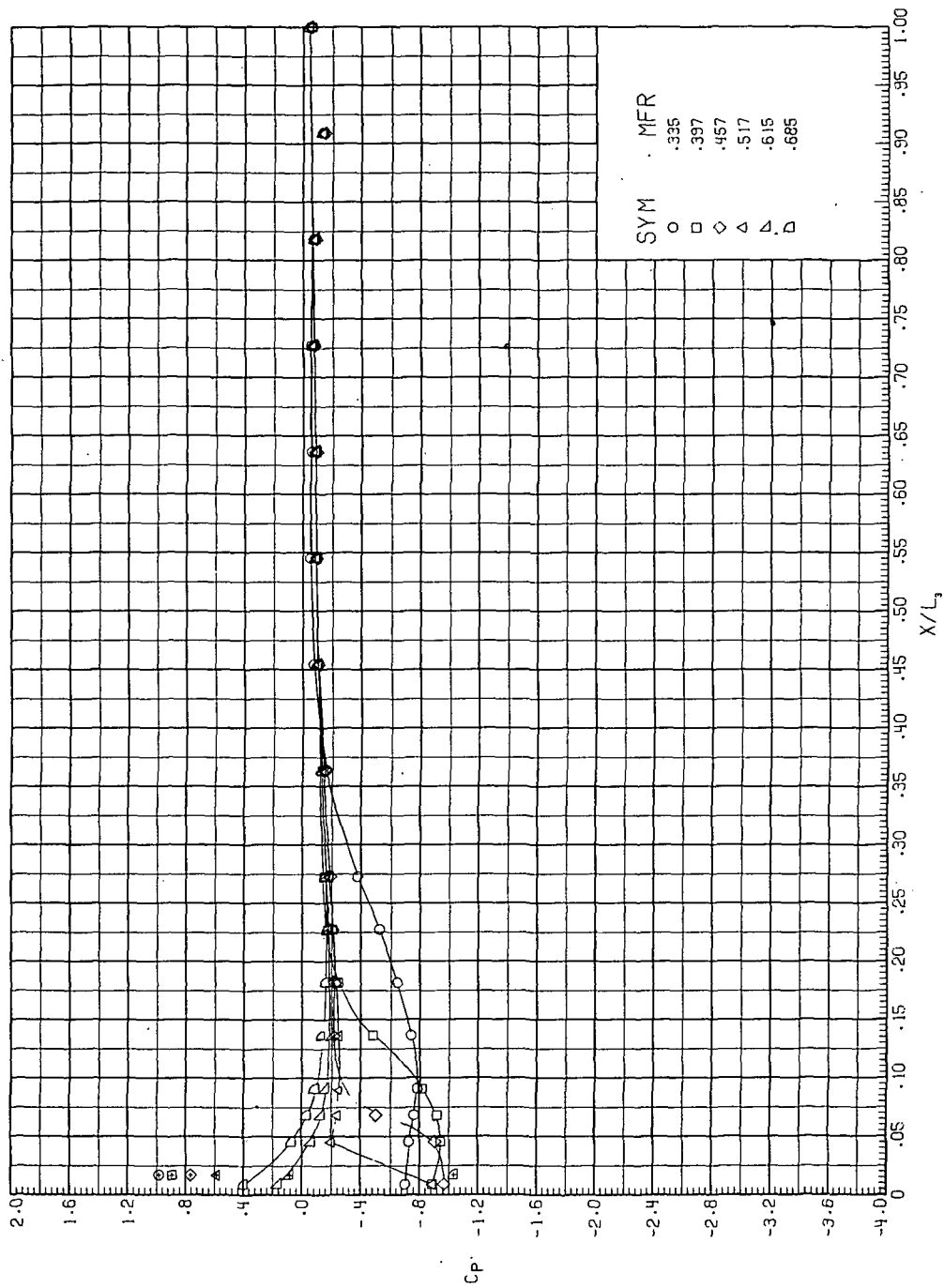
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 33.- Pressure coefficients for cowl 20-0. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



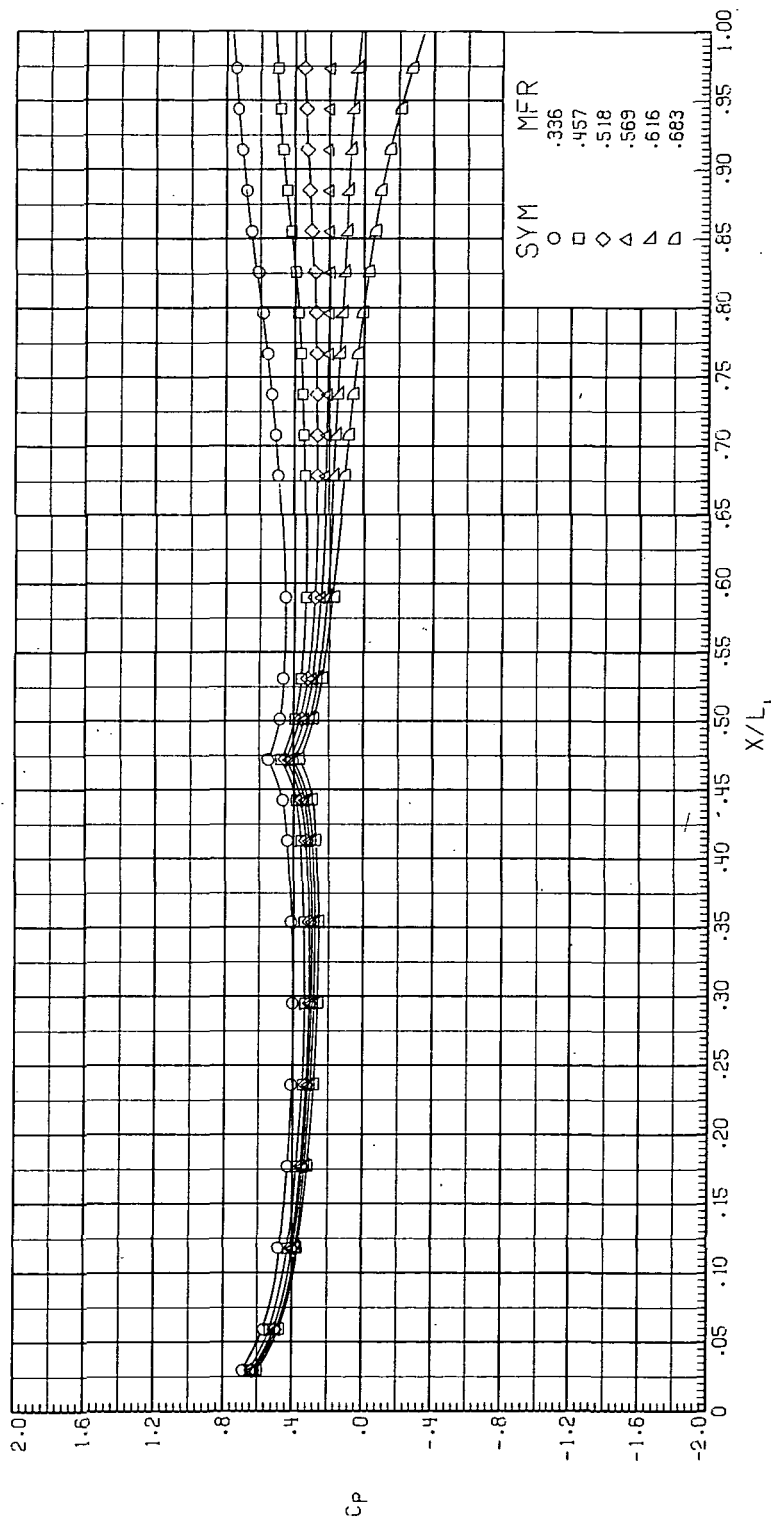
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



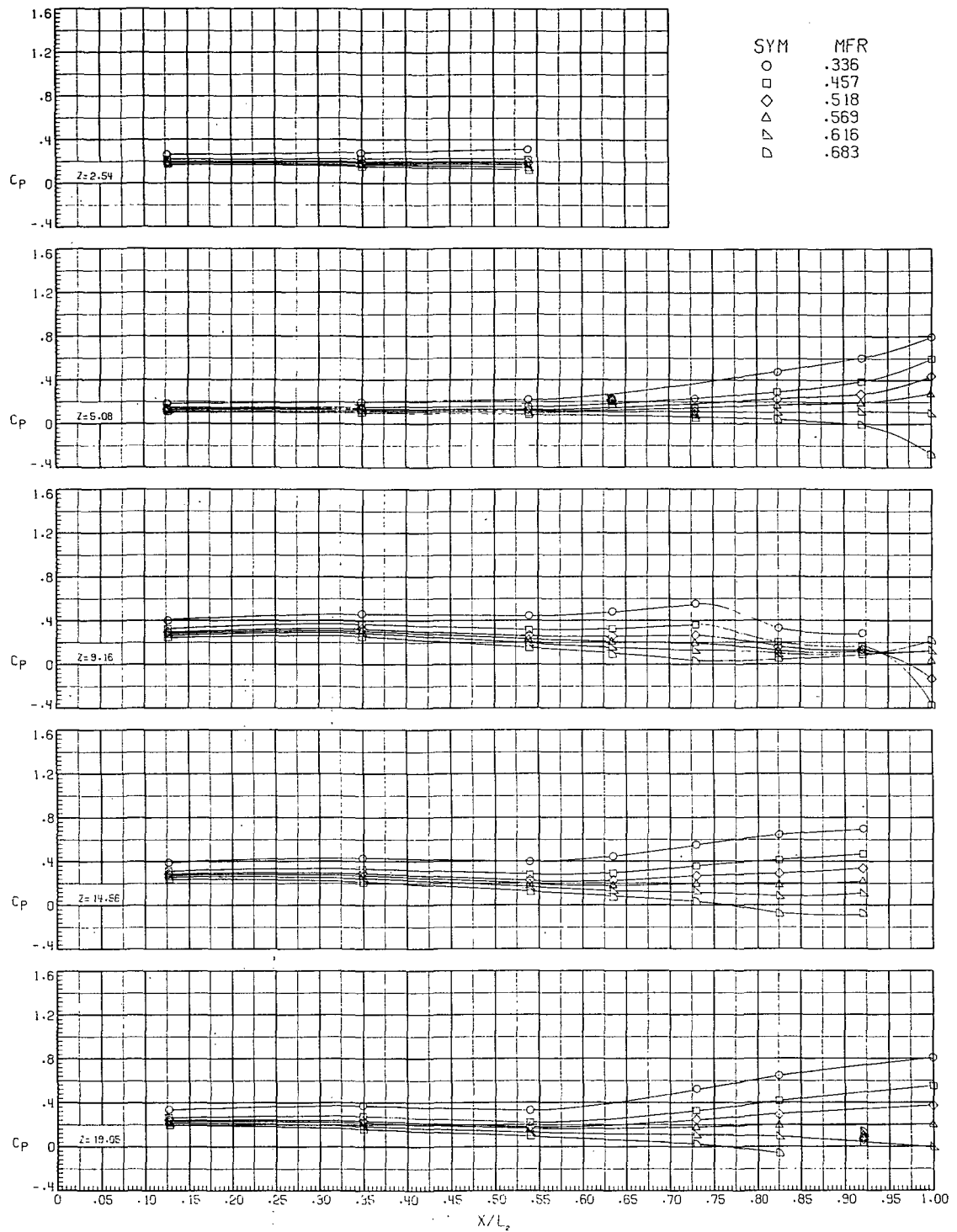
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



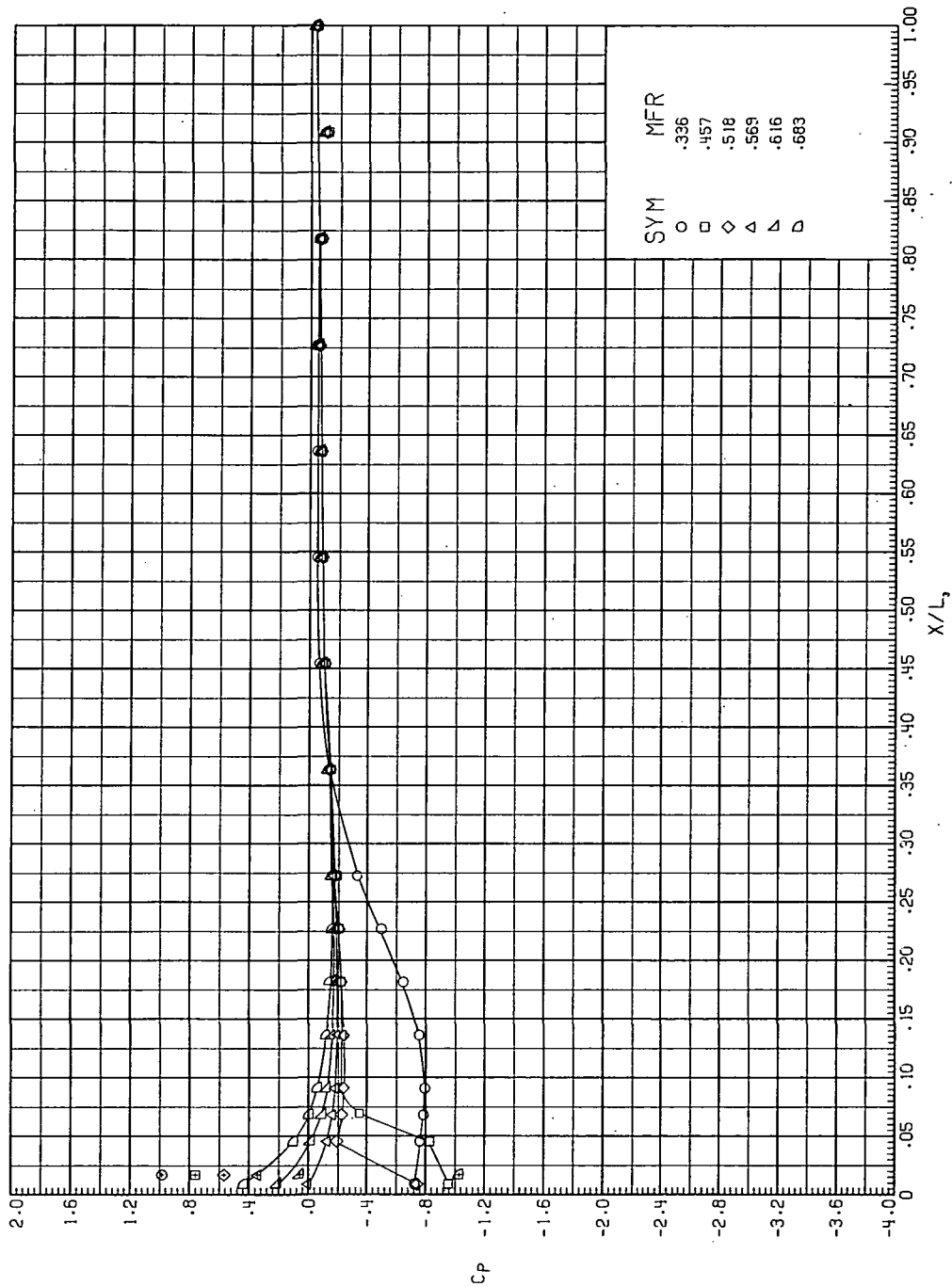
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 33.- Continued.



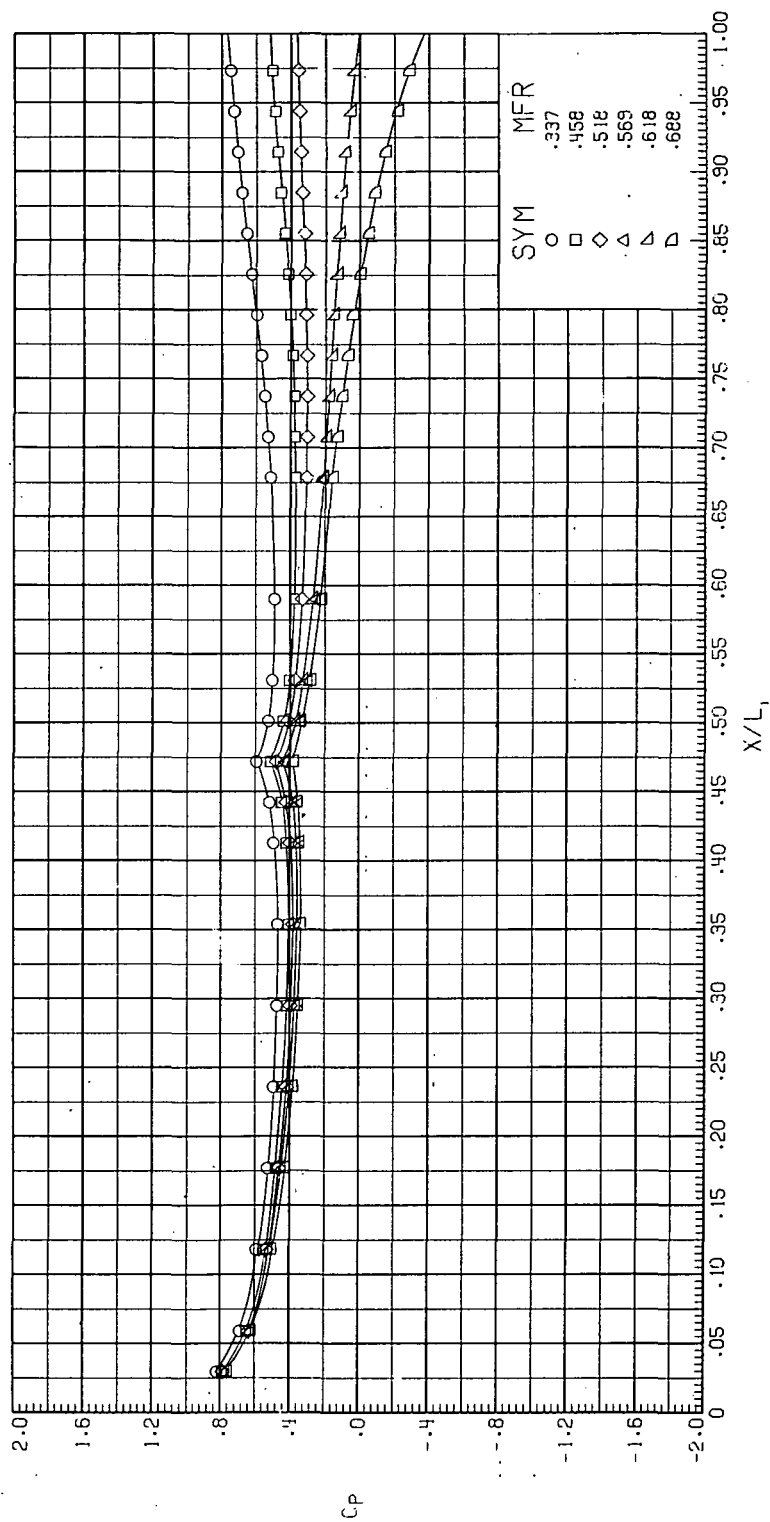
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



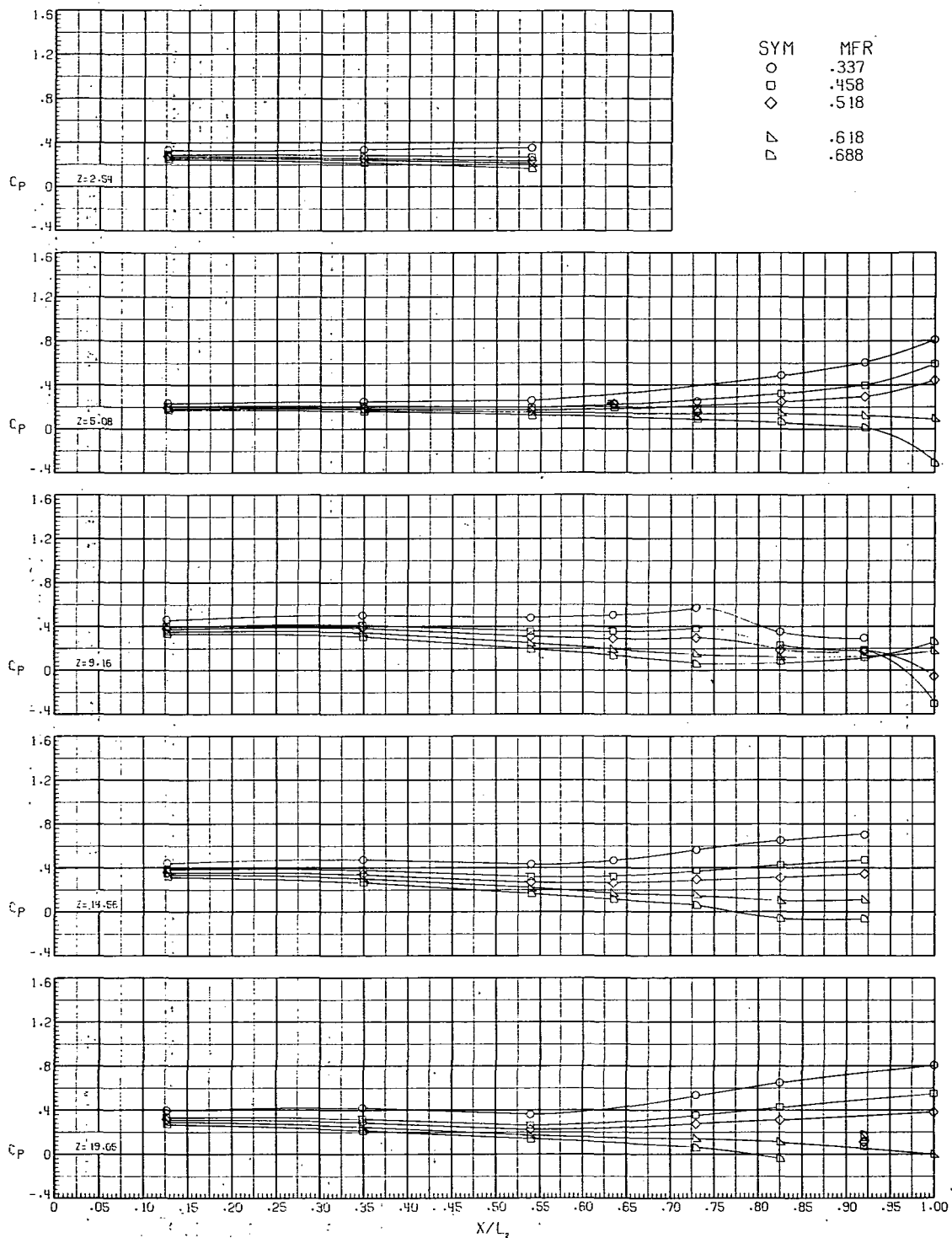
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



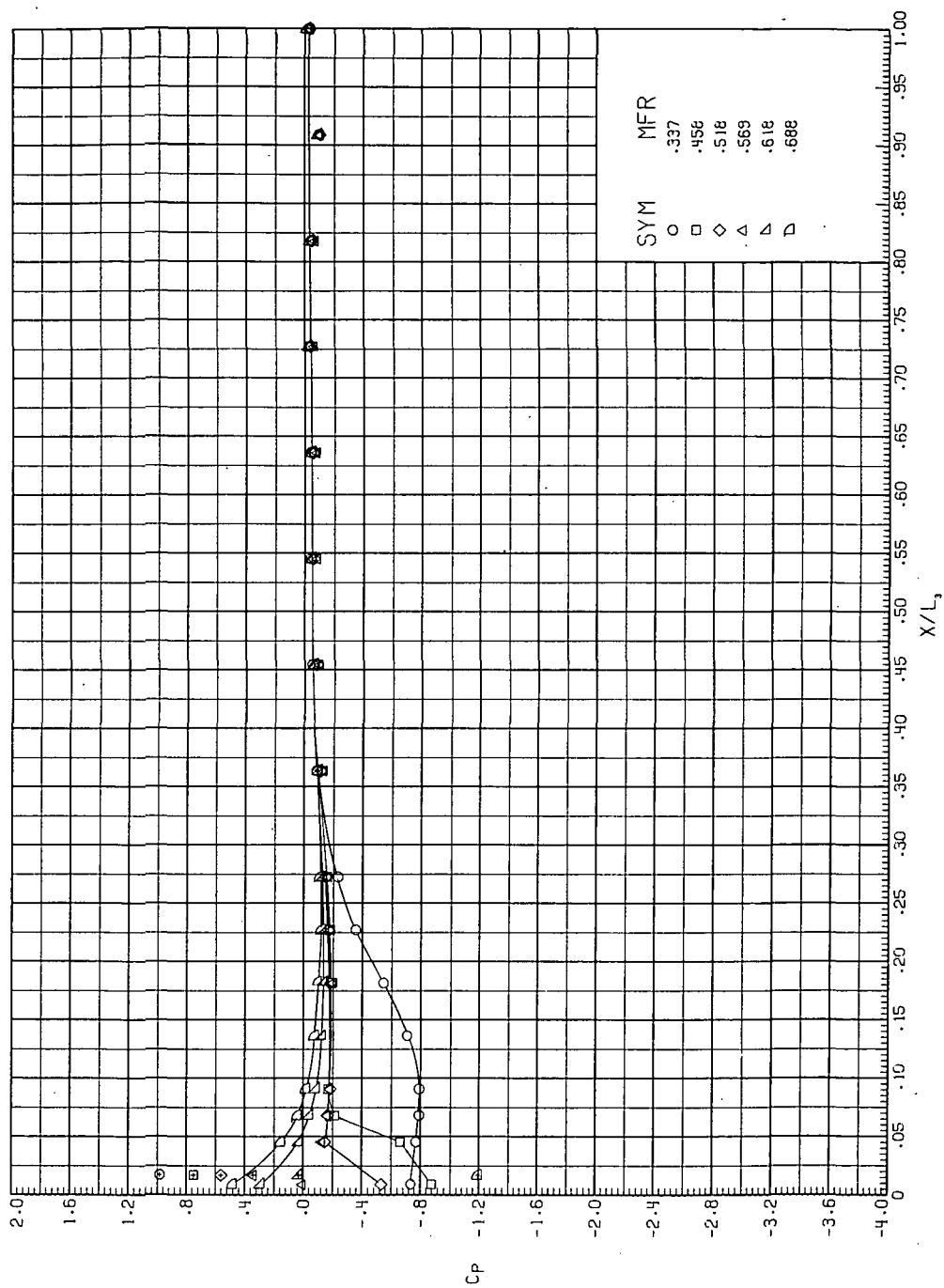
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 33.- Continued.



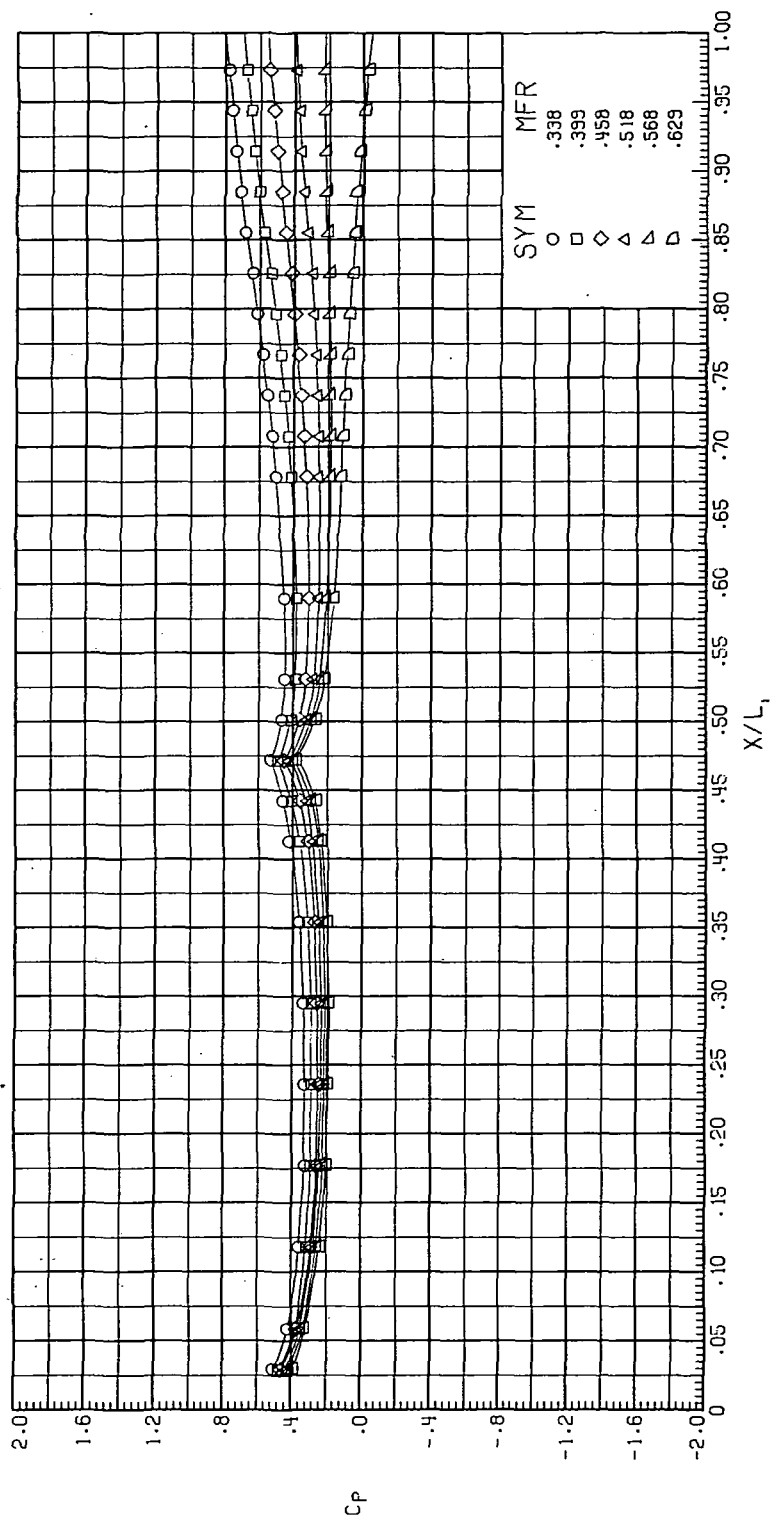
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



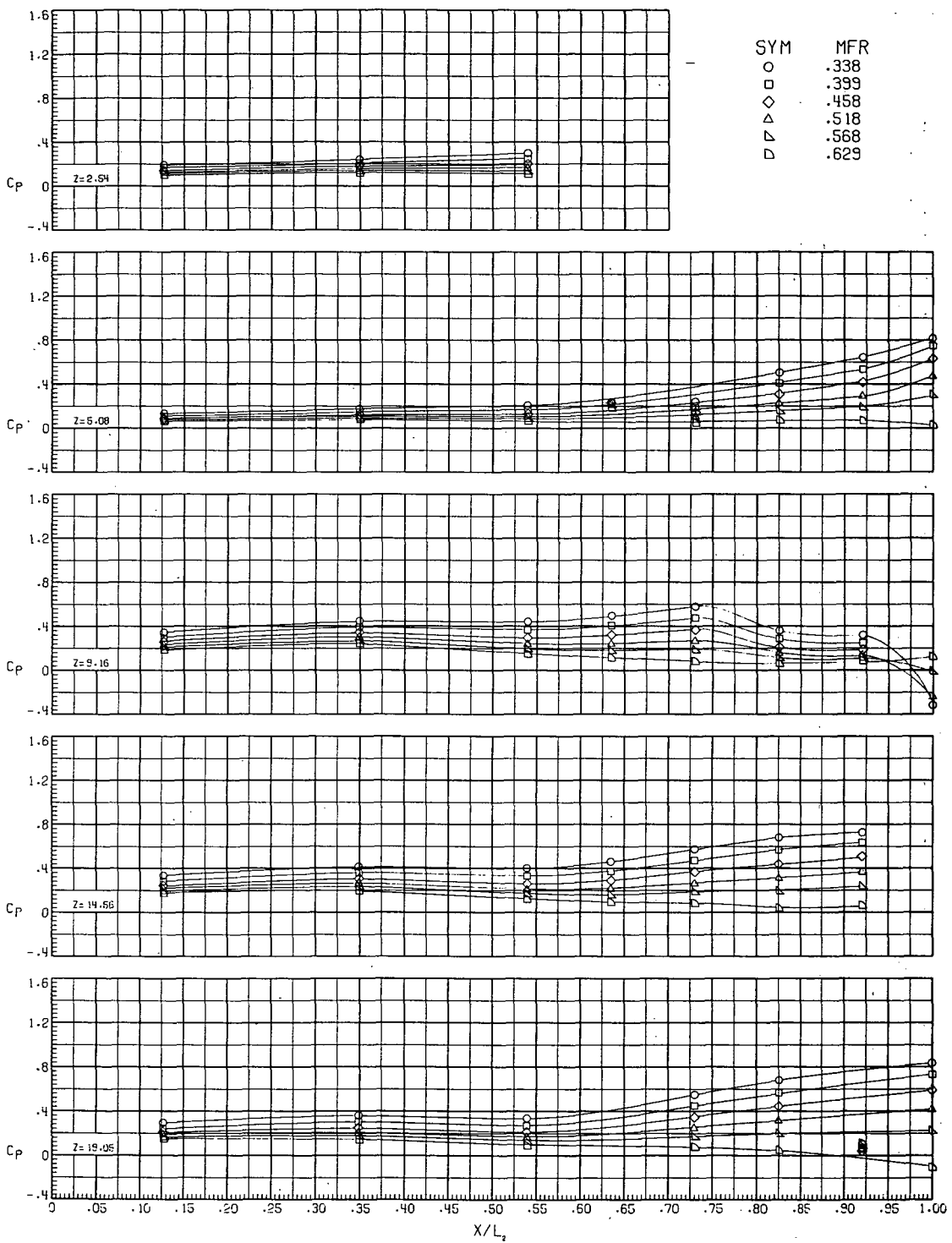
(c) $M = 0.6$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



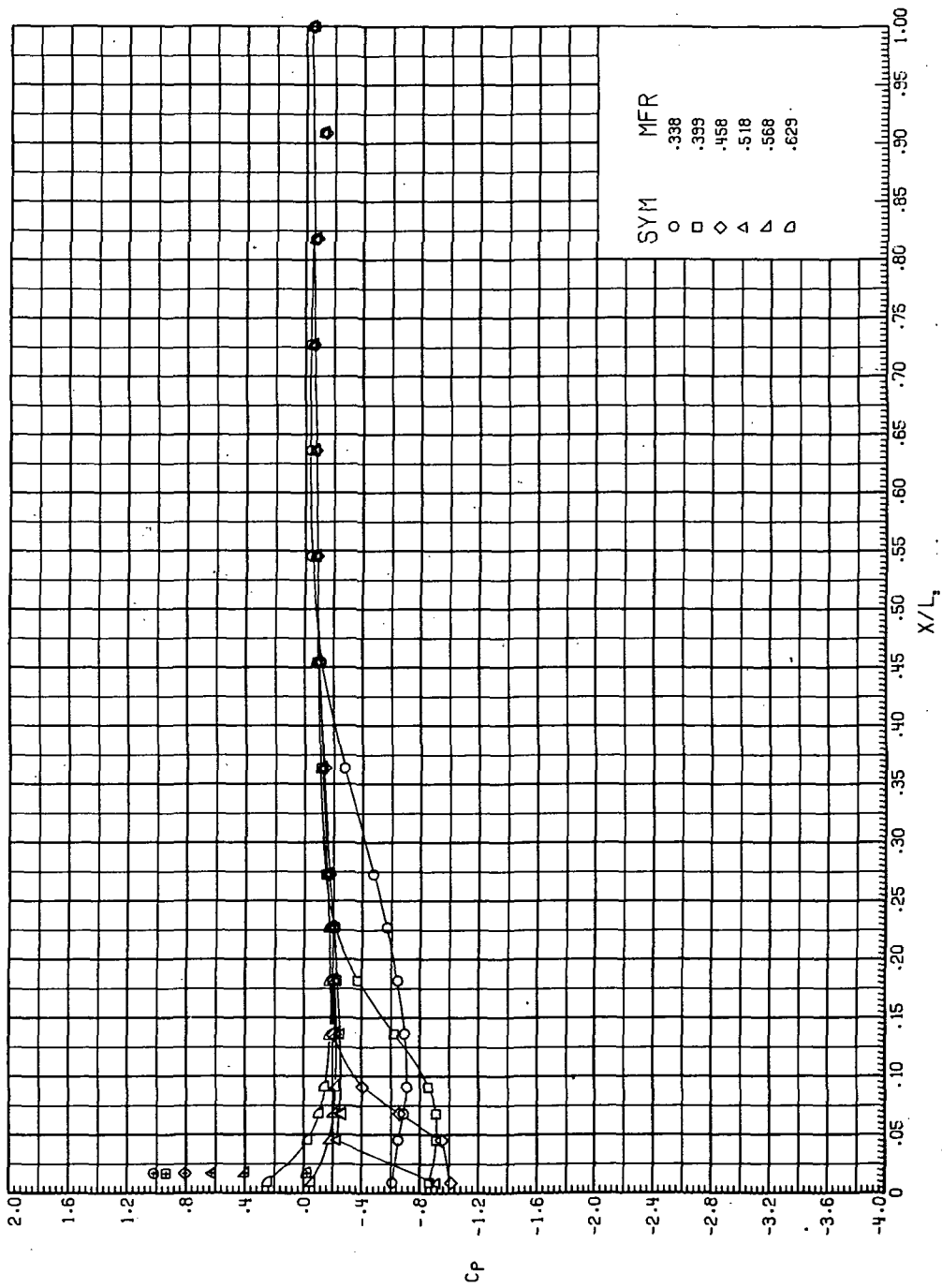
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 33. - Continued.



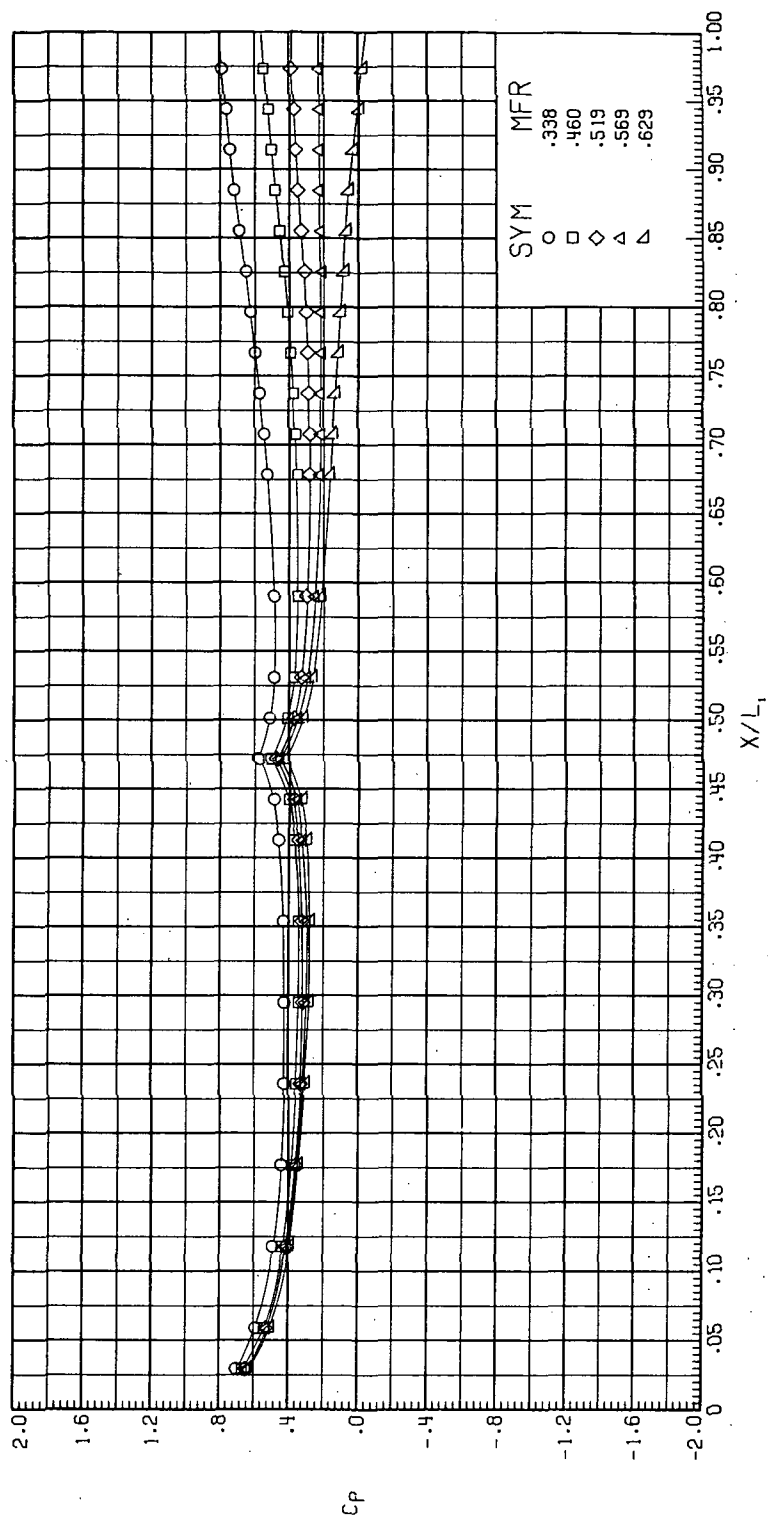
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



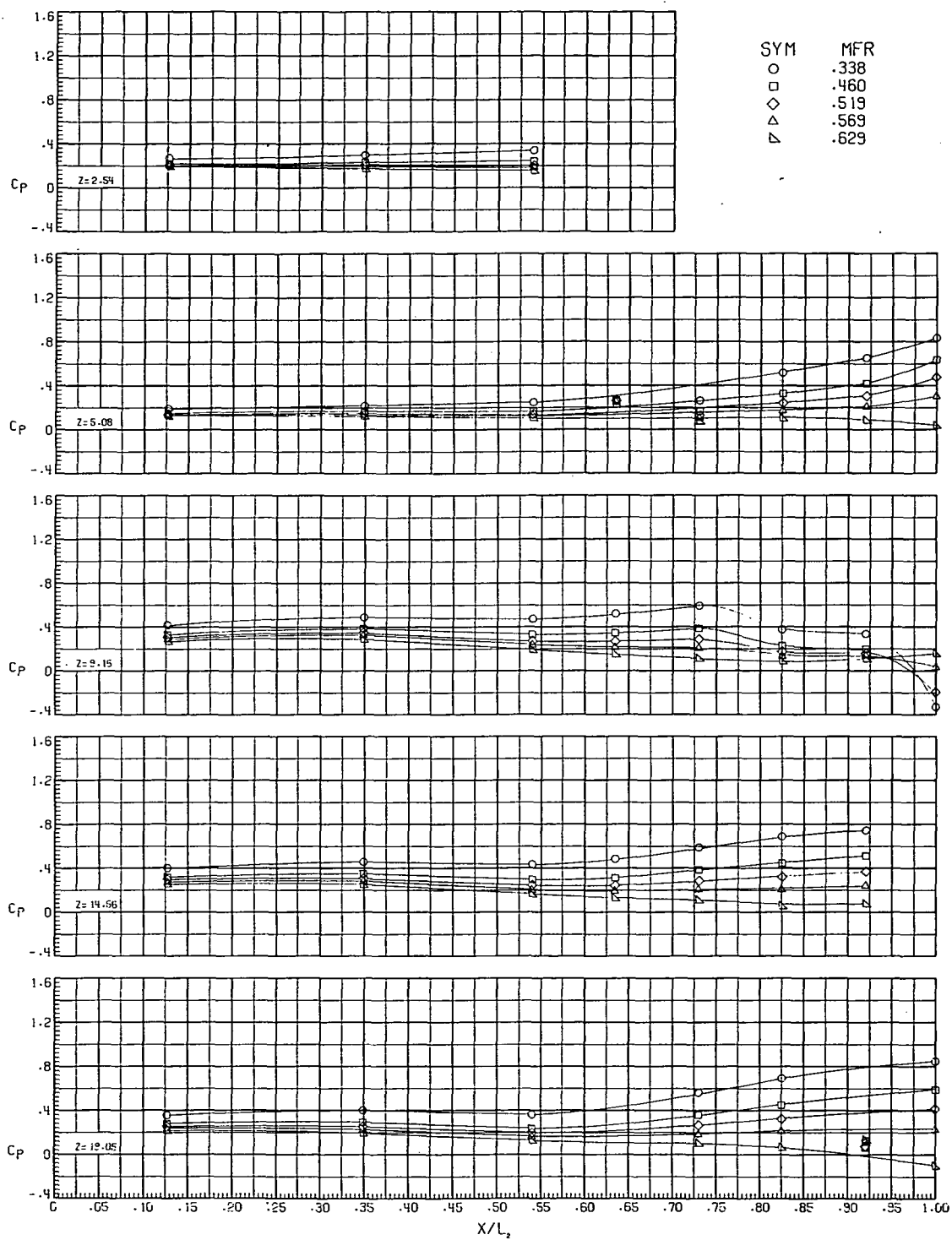
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33. - Continued.



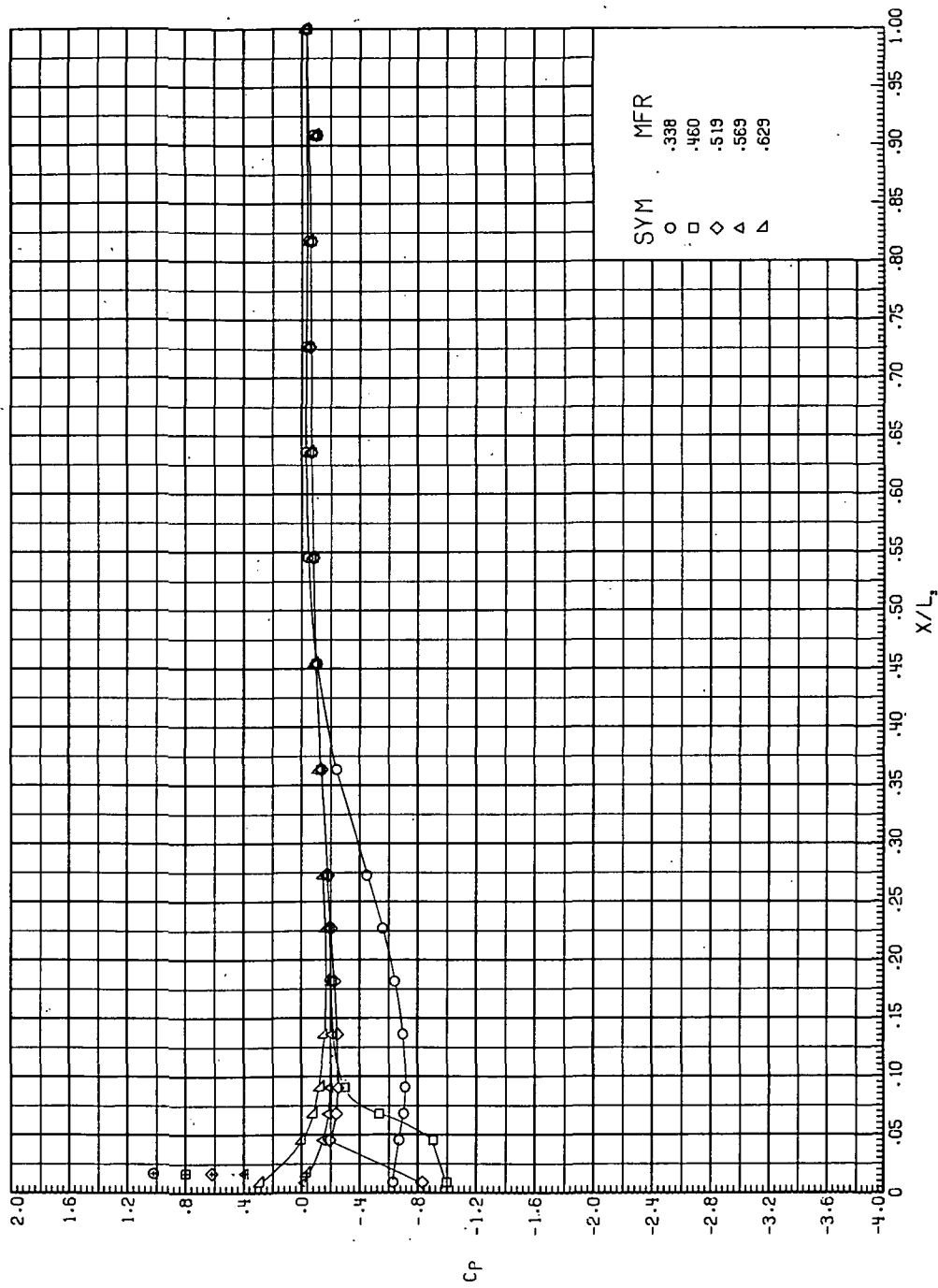
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 33. - Continued.



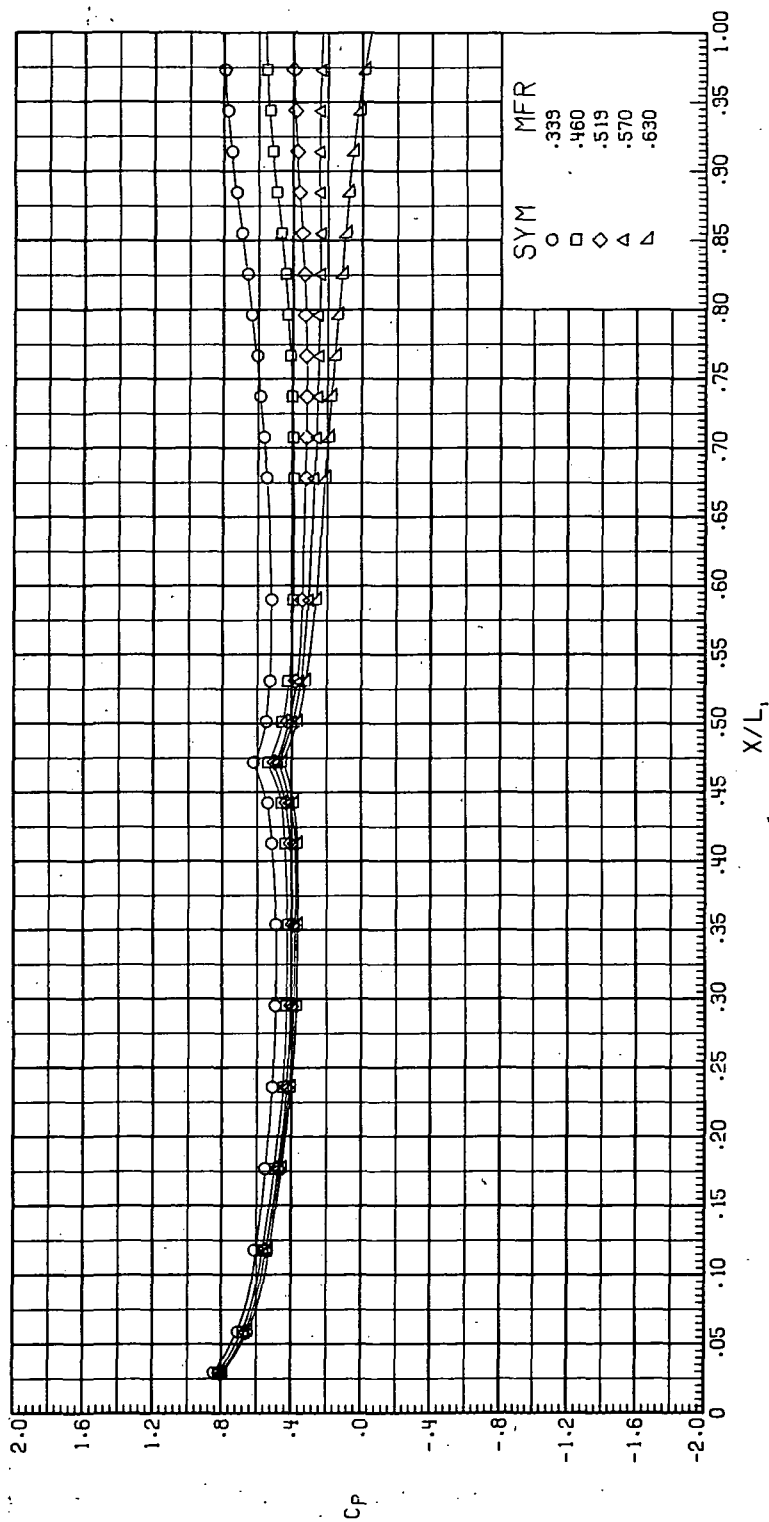
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



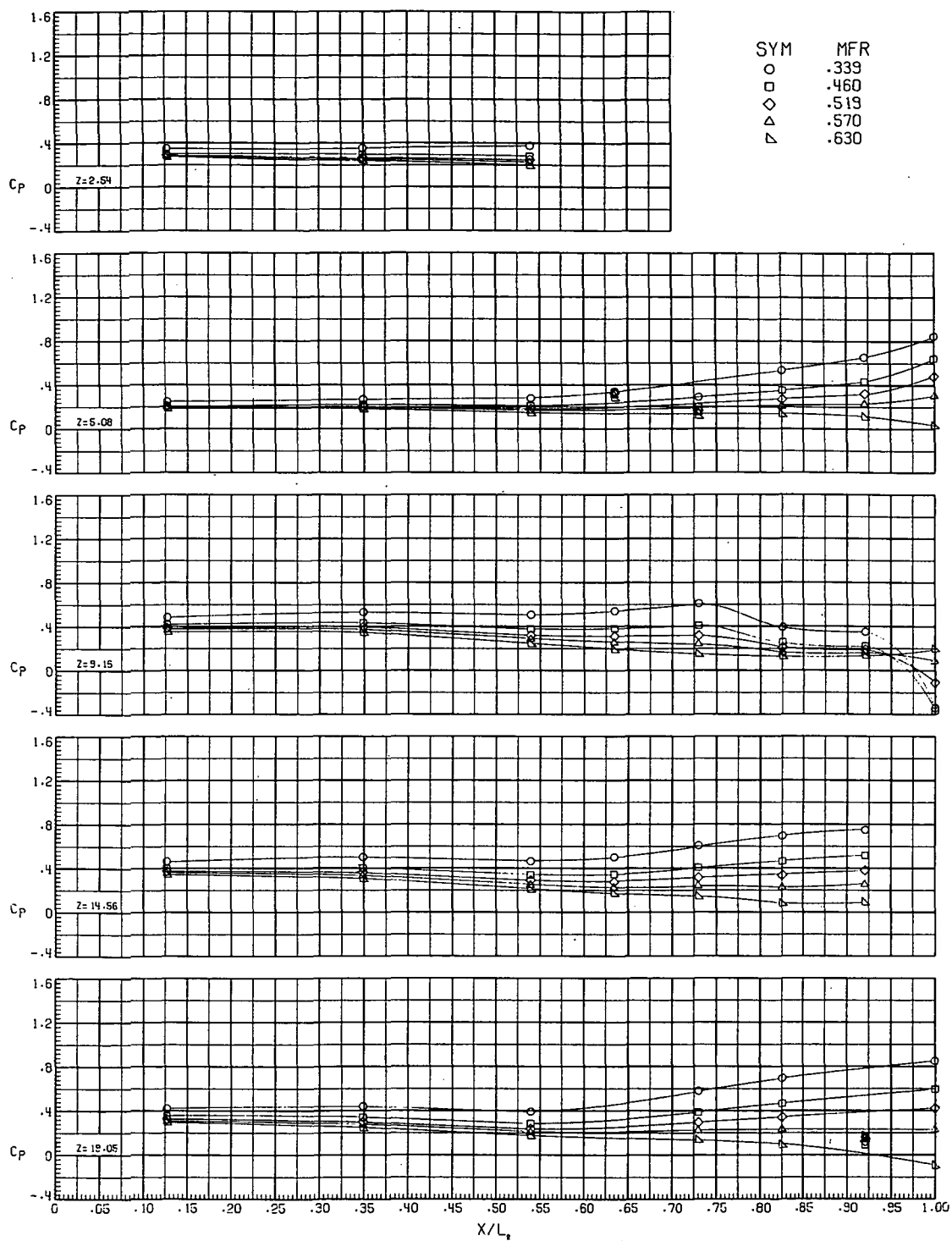
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



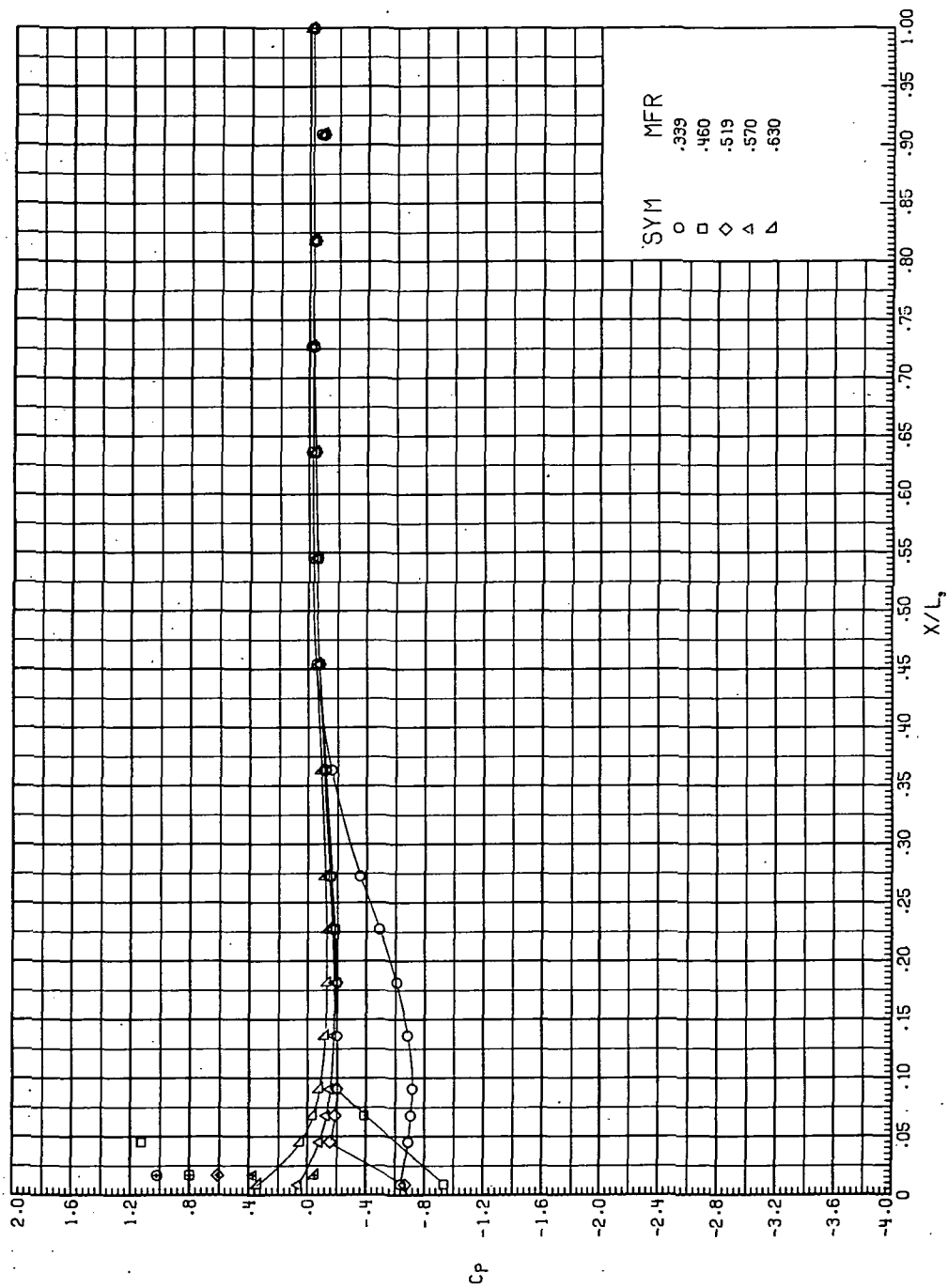
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 33.- Continued.



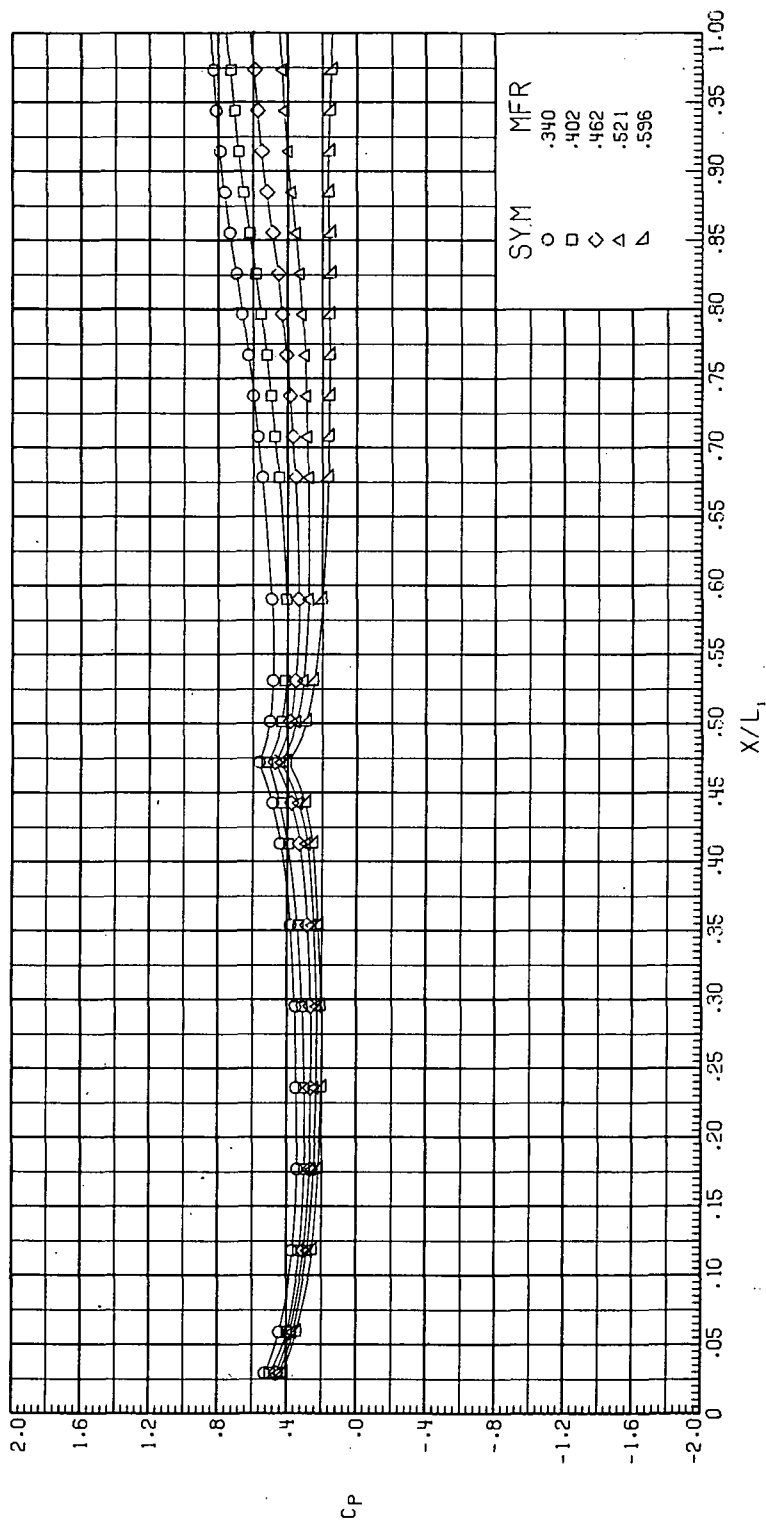
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



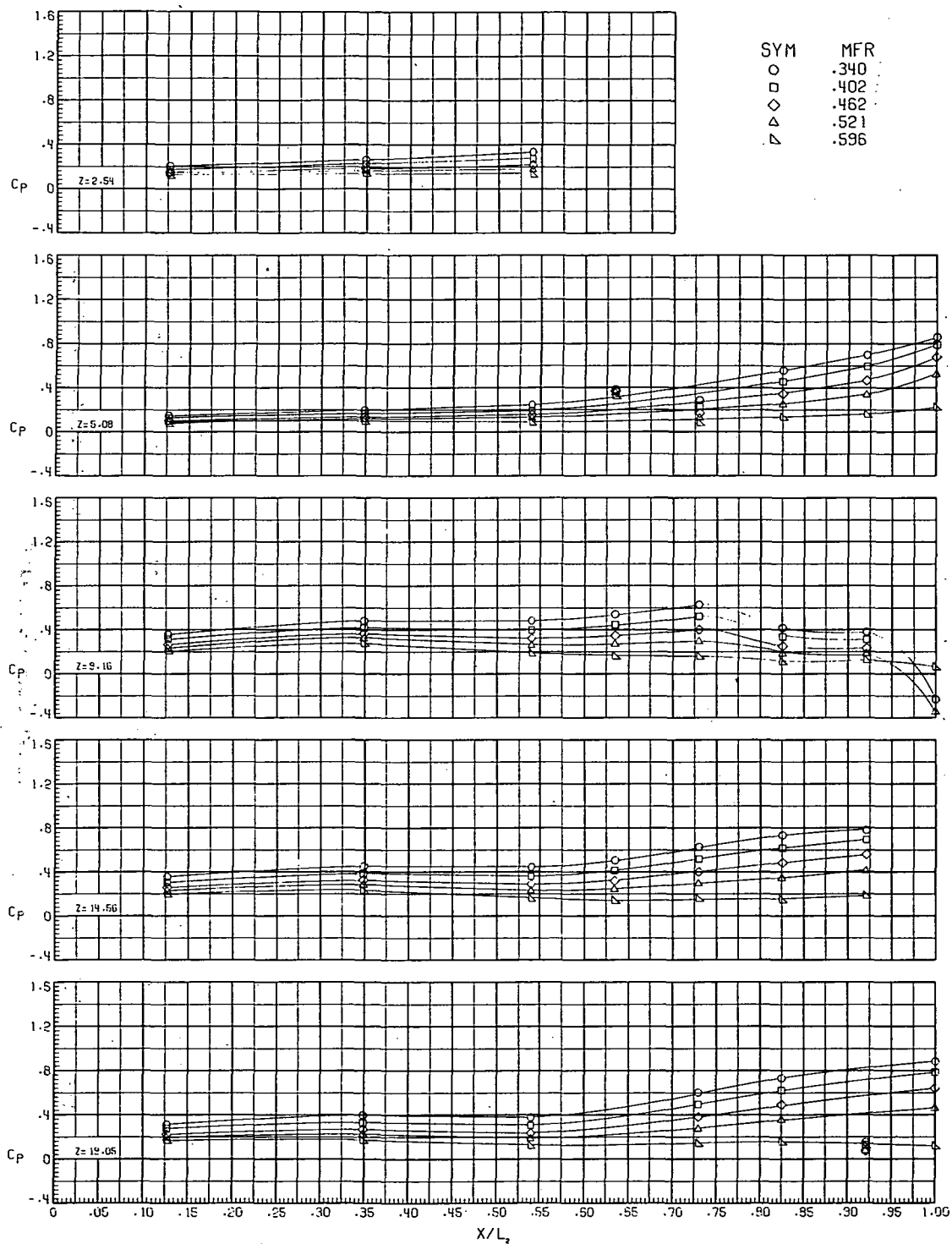
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



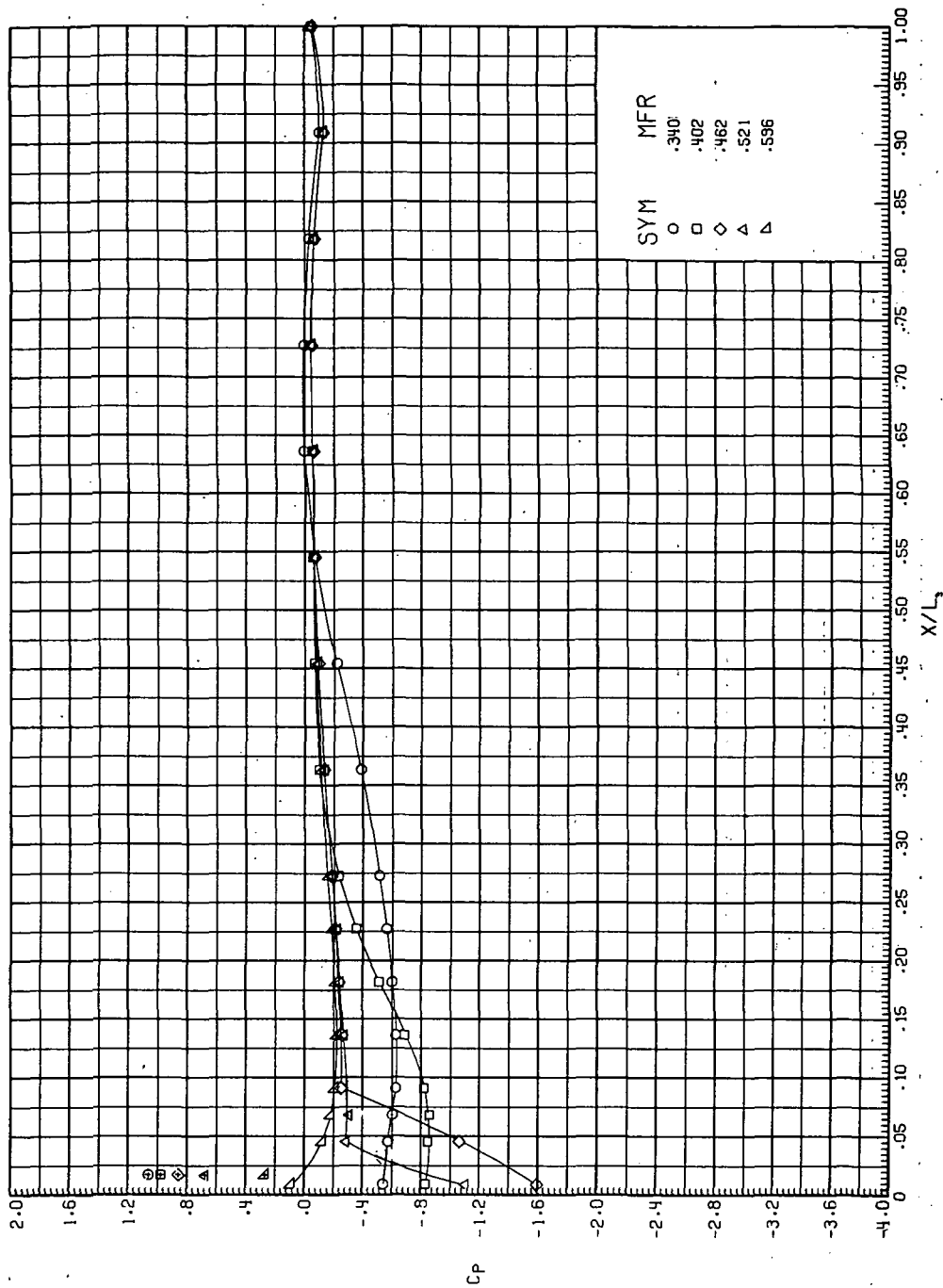
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 33. - Continued.



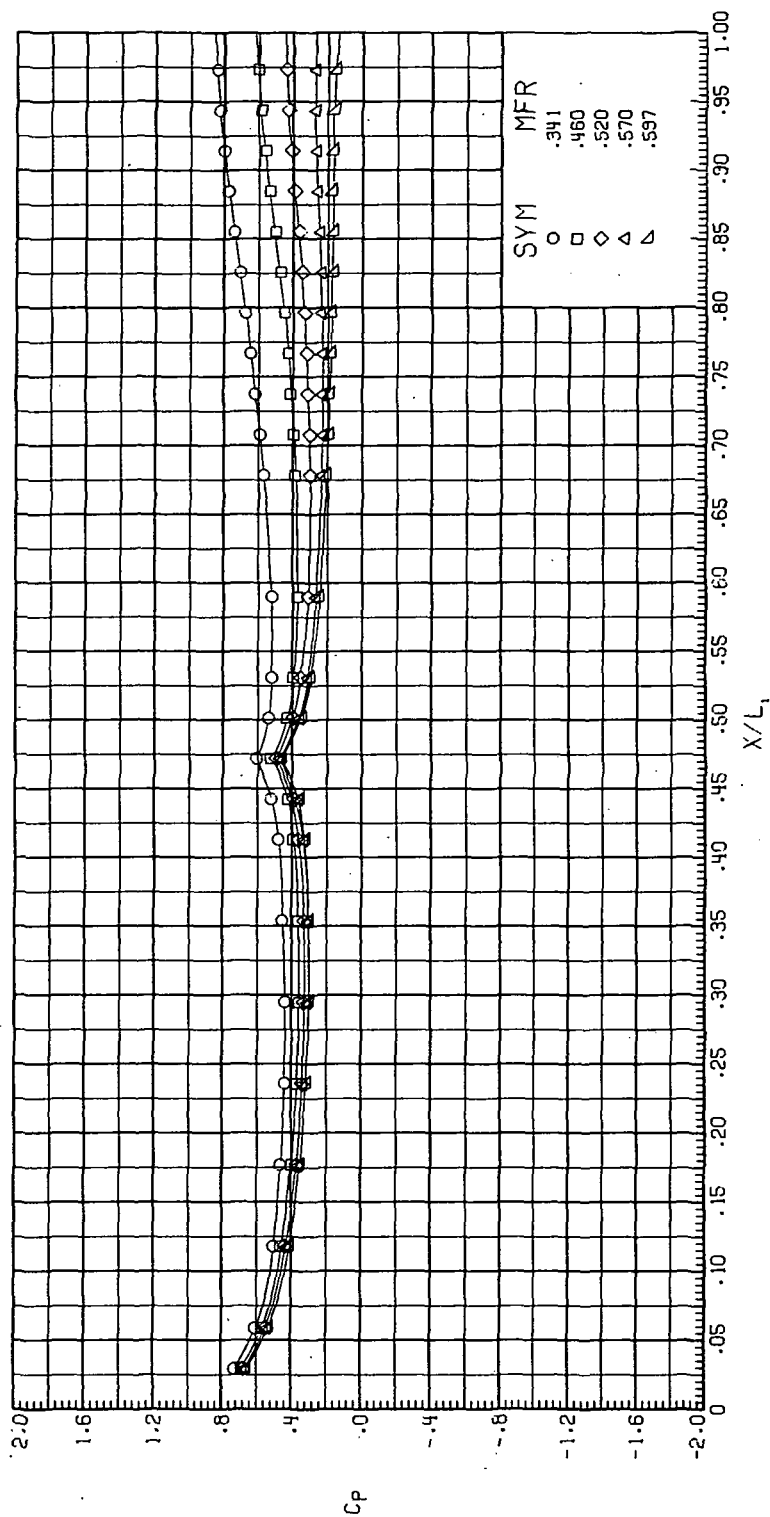
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



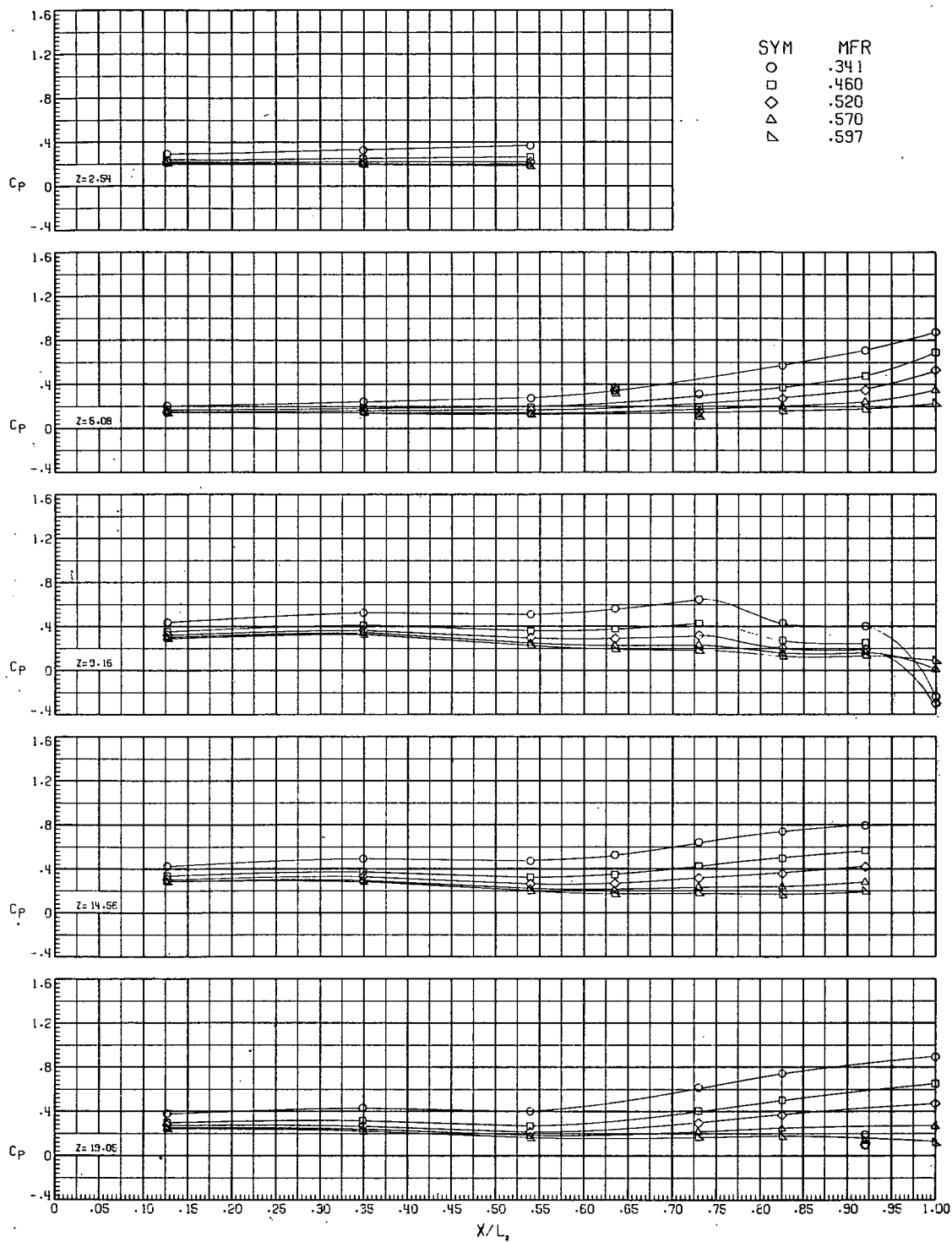
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Continued.



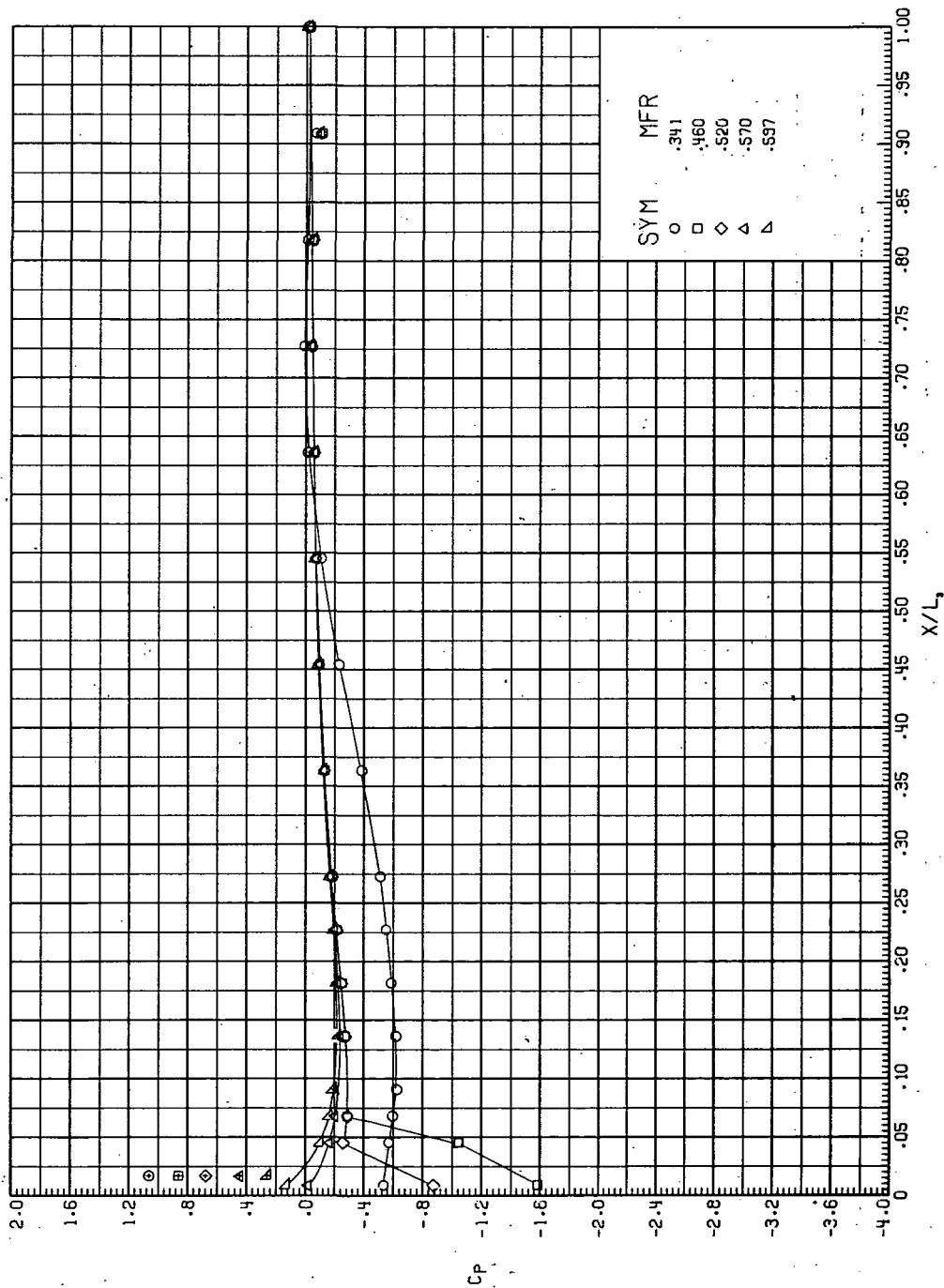
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 33.- Continued.



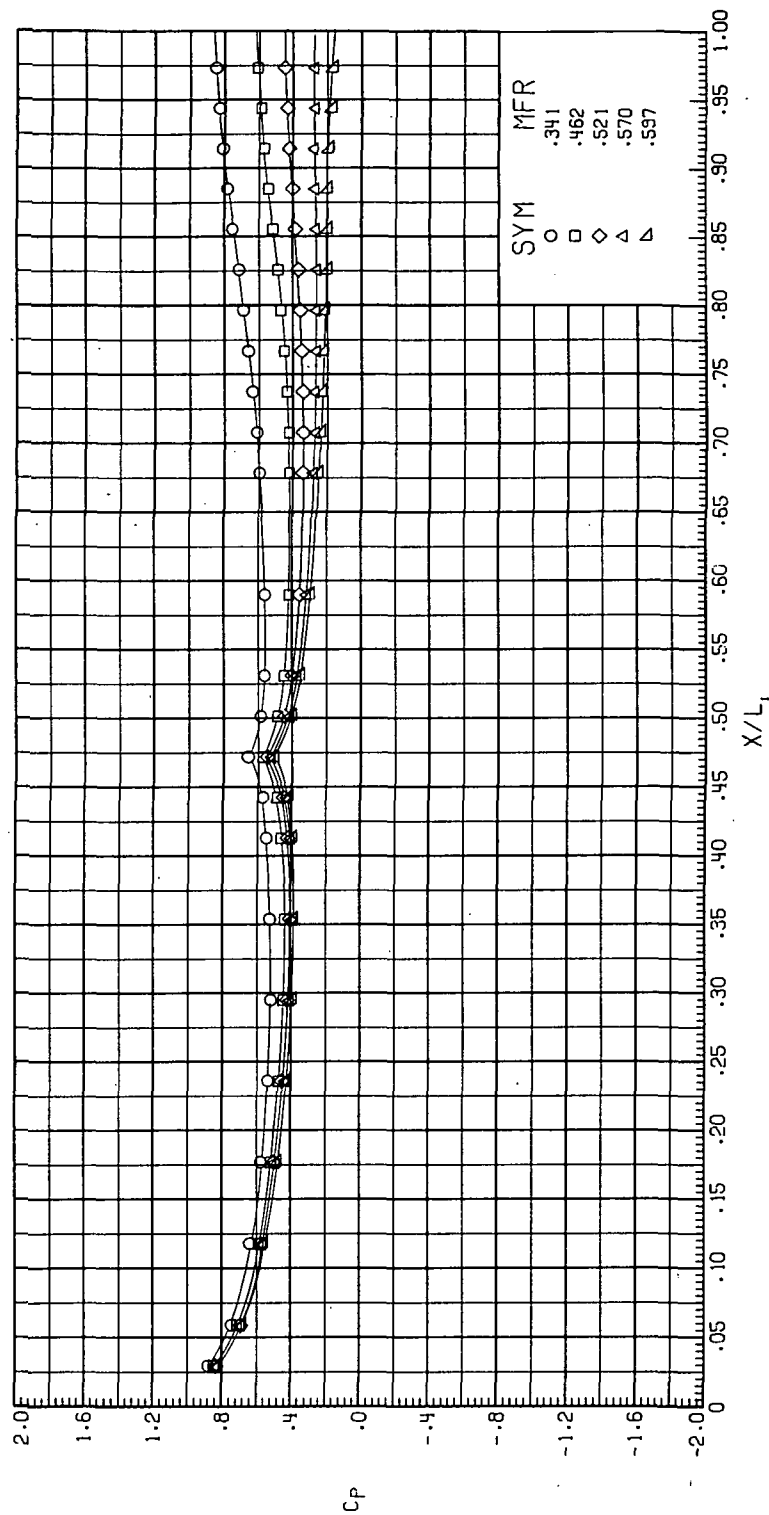
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



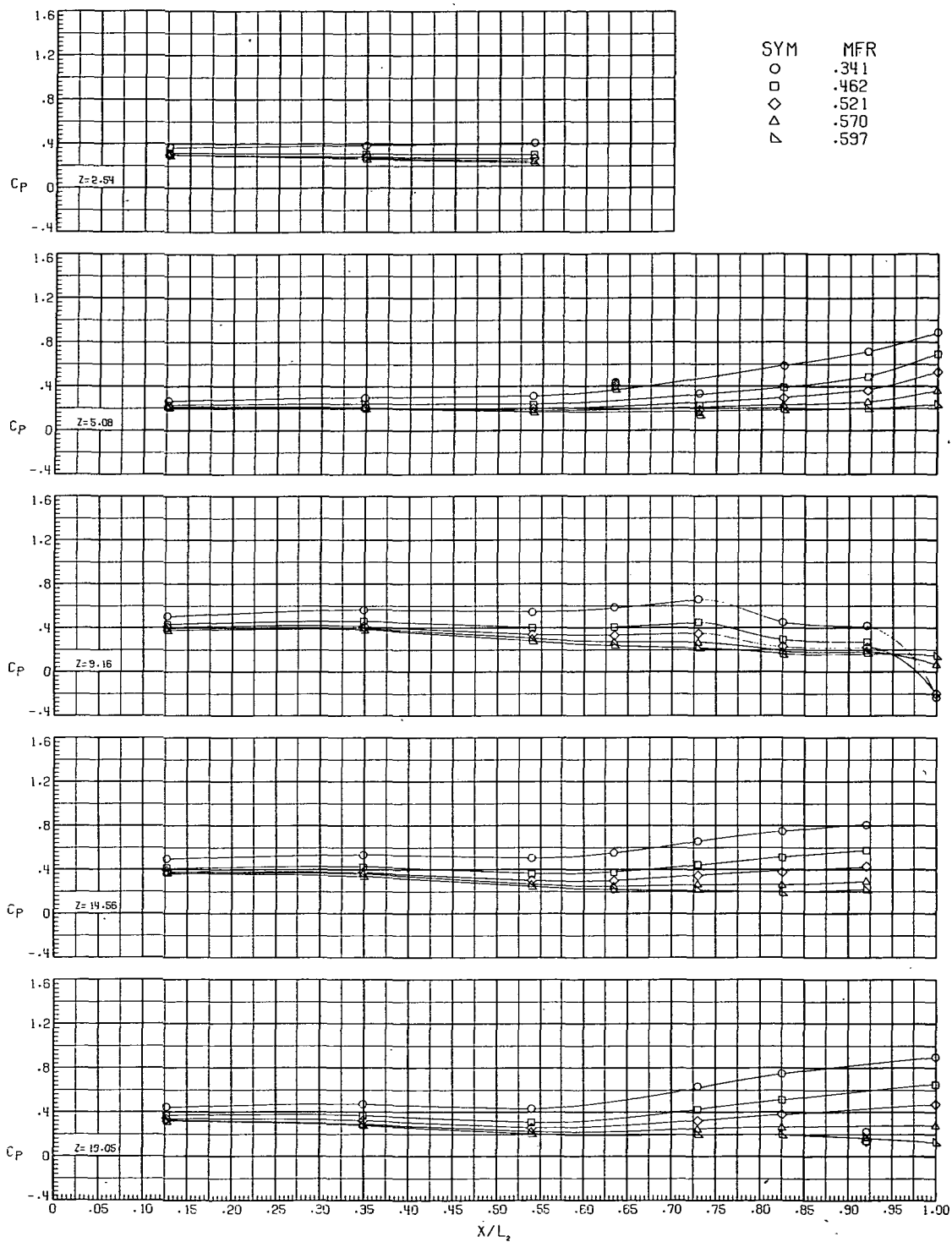
(h) $M = 0.8$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33. - Continued.



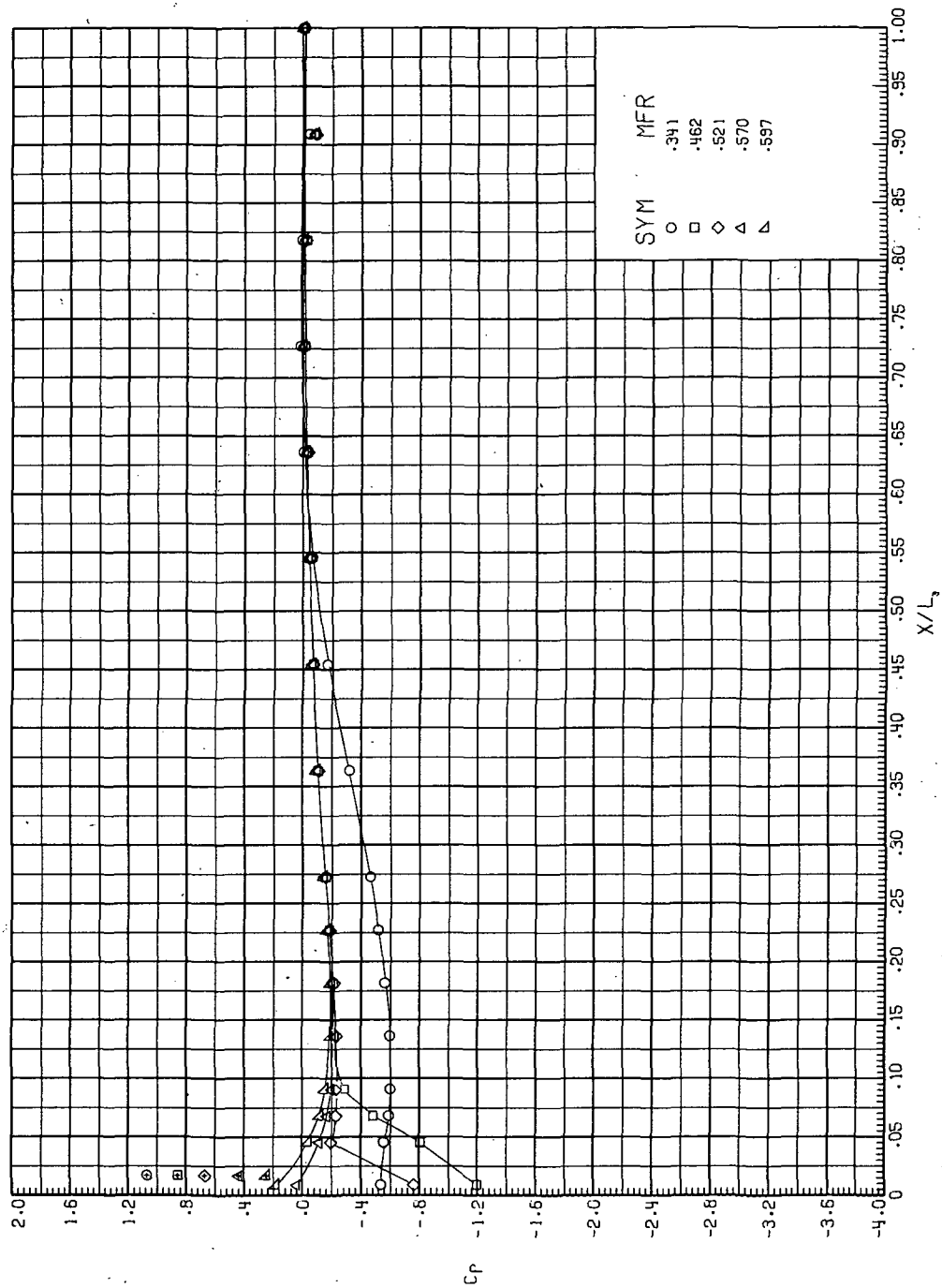
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 33. - Continued.



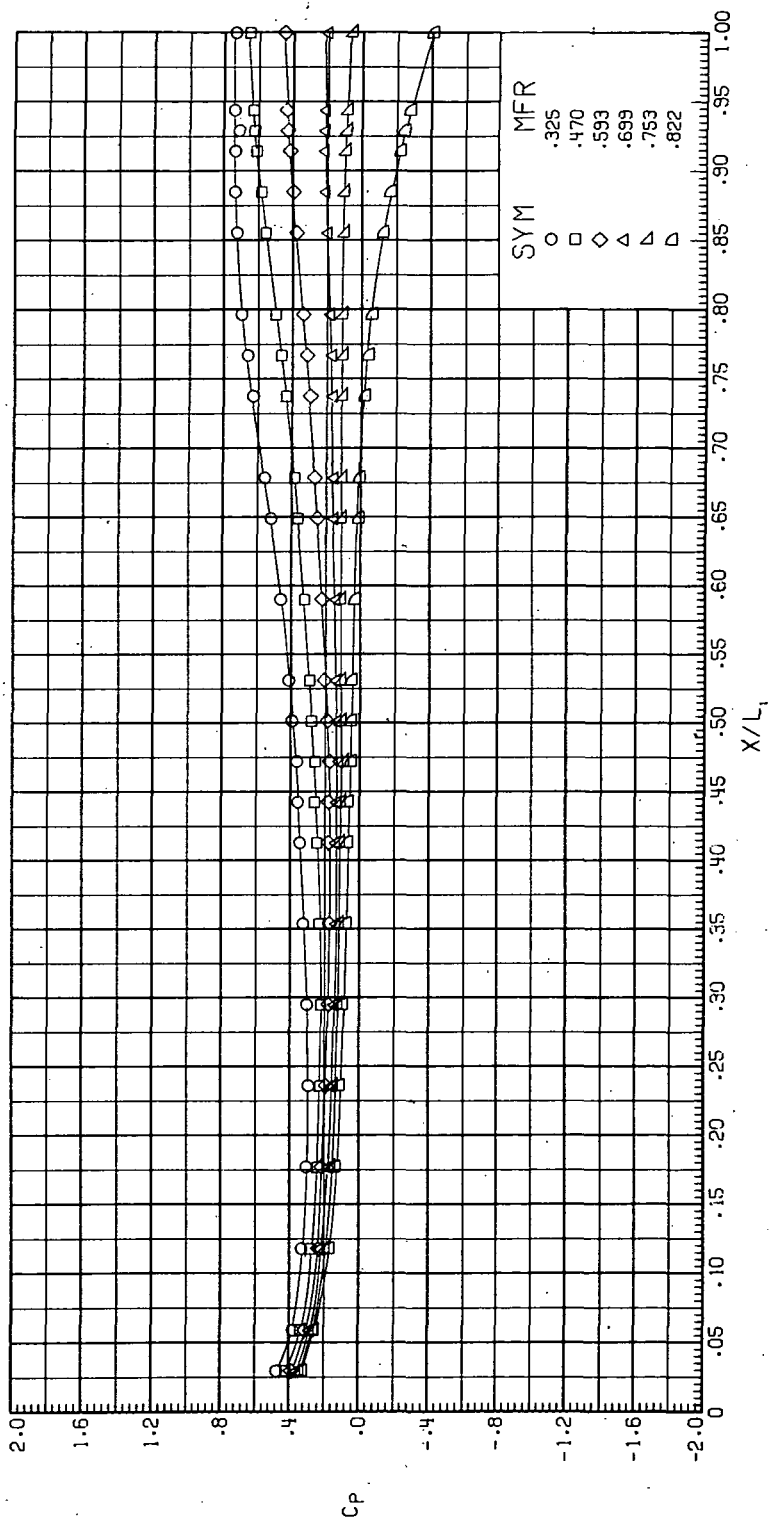
(i) $M \approx 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 33.- Continued.



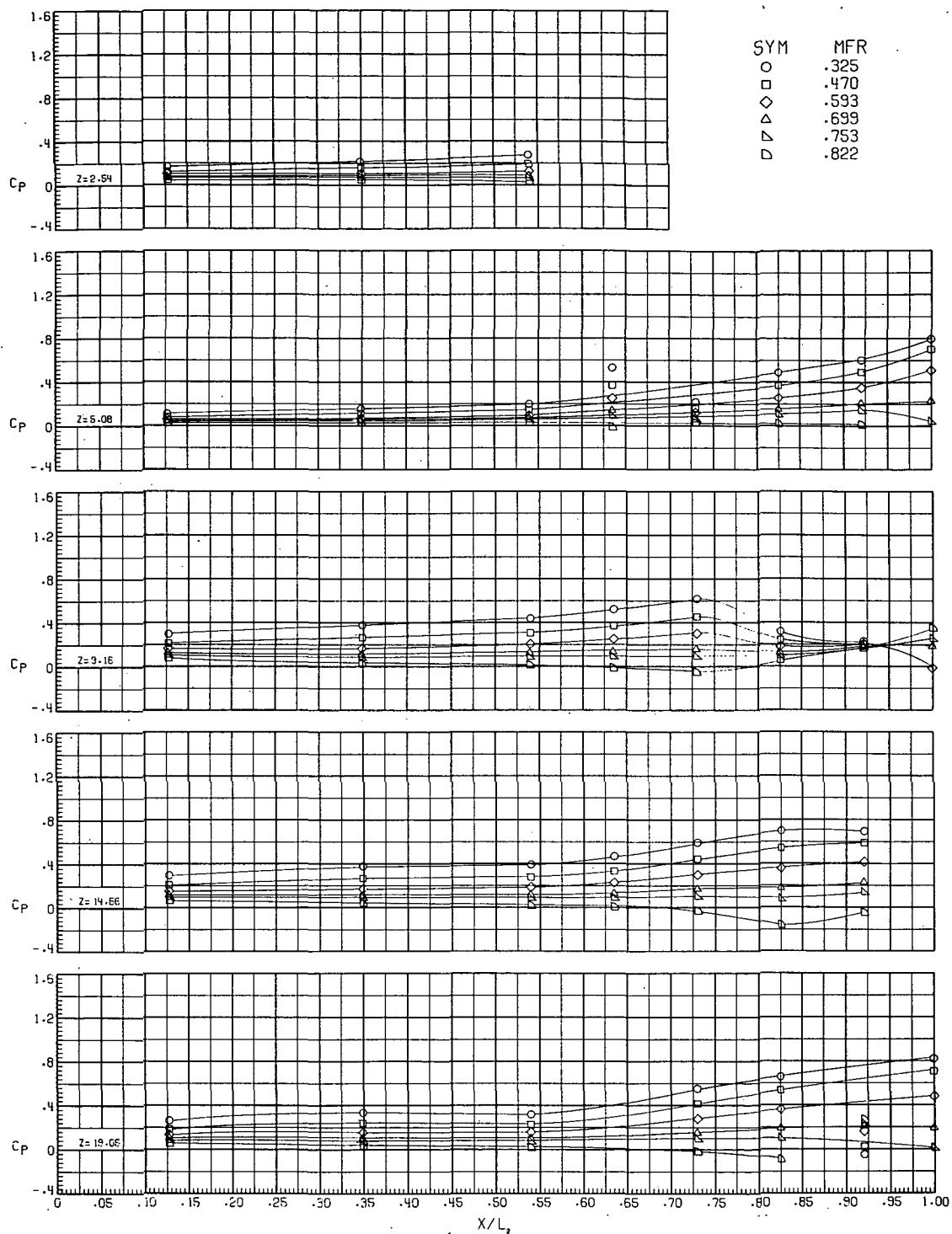
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 33.- Concluded.



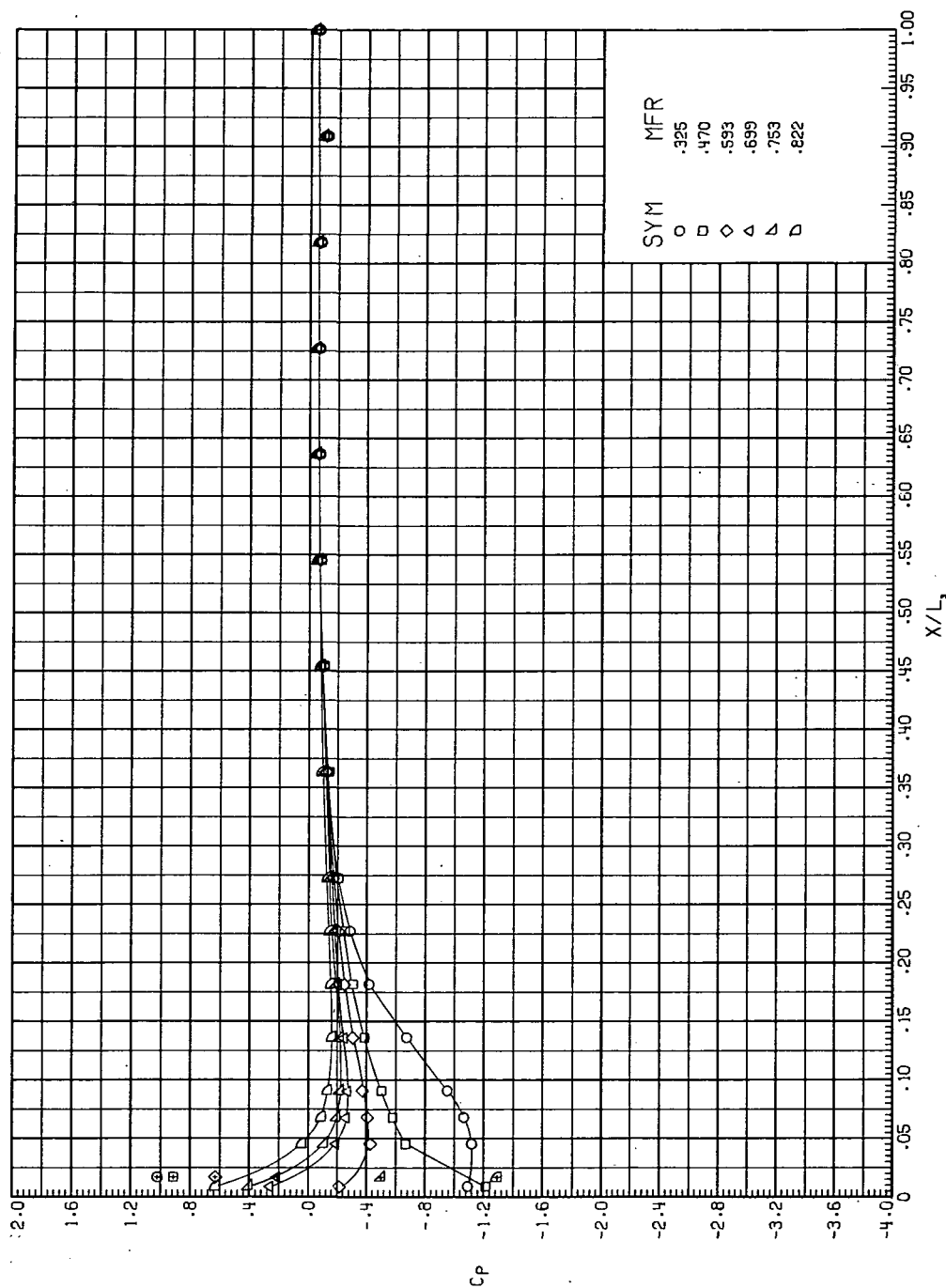
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 34.- Pressure coefficients for cowl 45-0. $\delta_1 = \delta_2 = 5^\circ$.



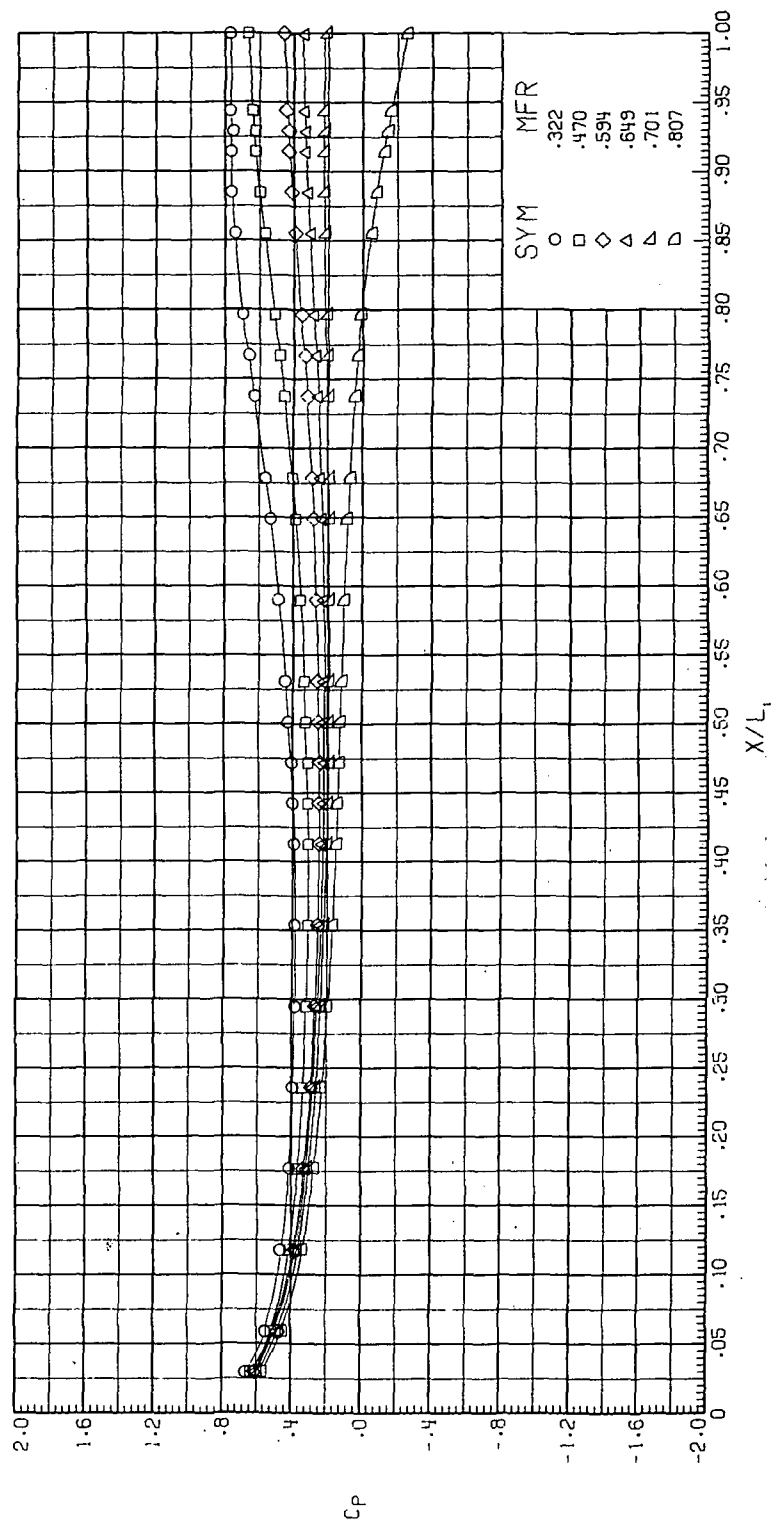
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



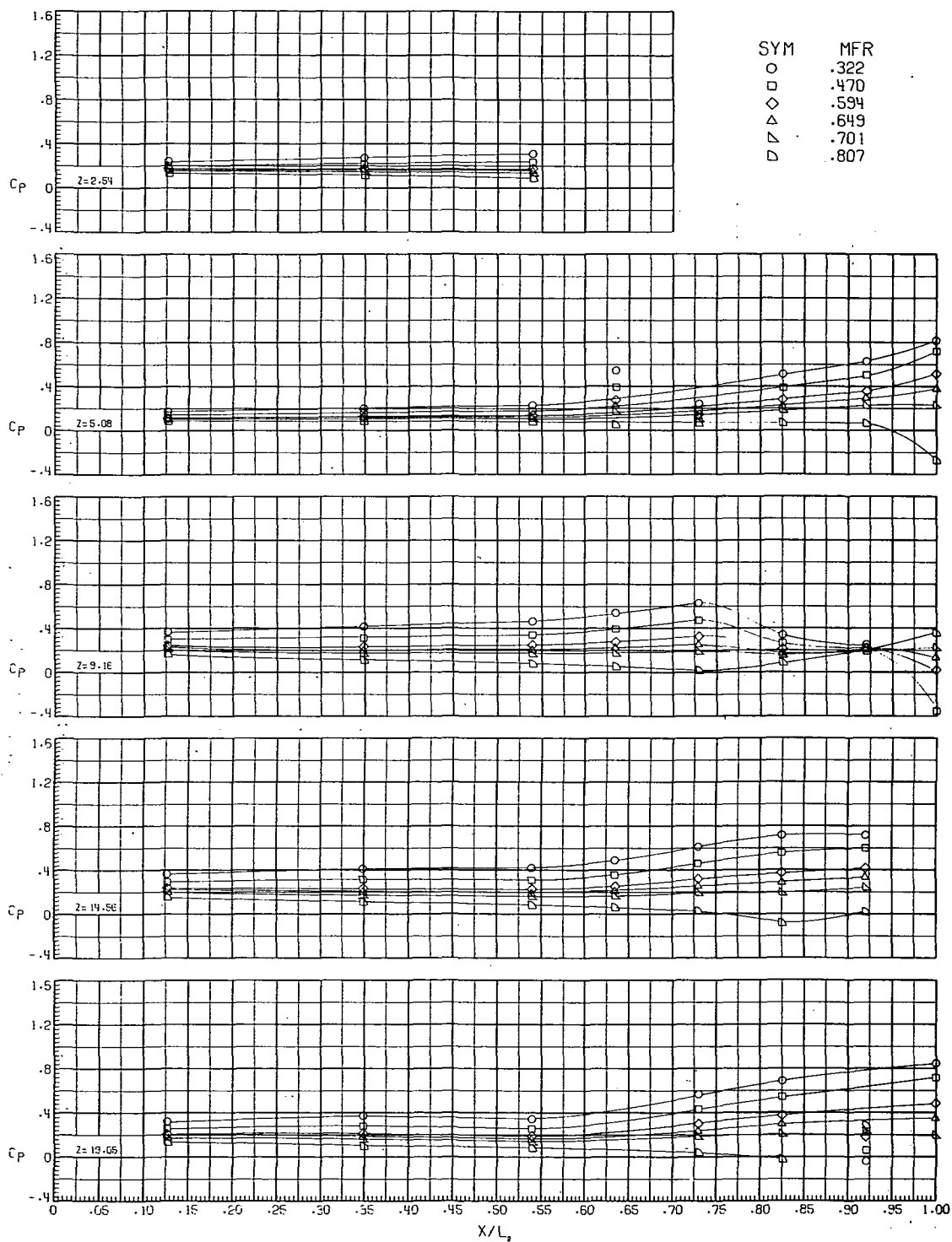
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34. - Continued.



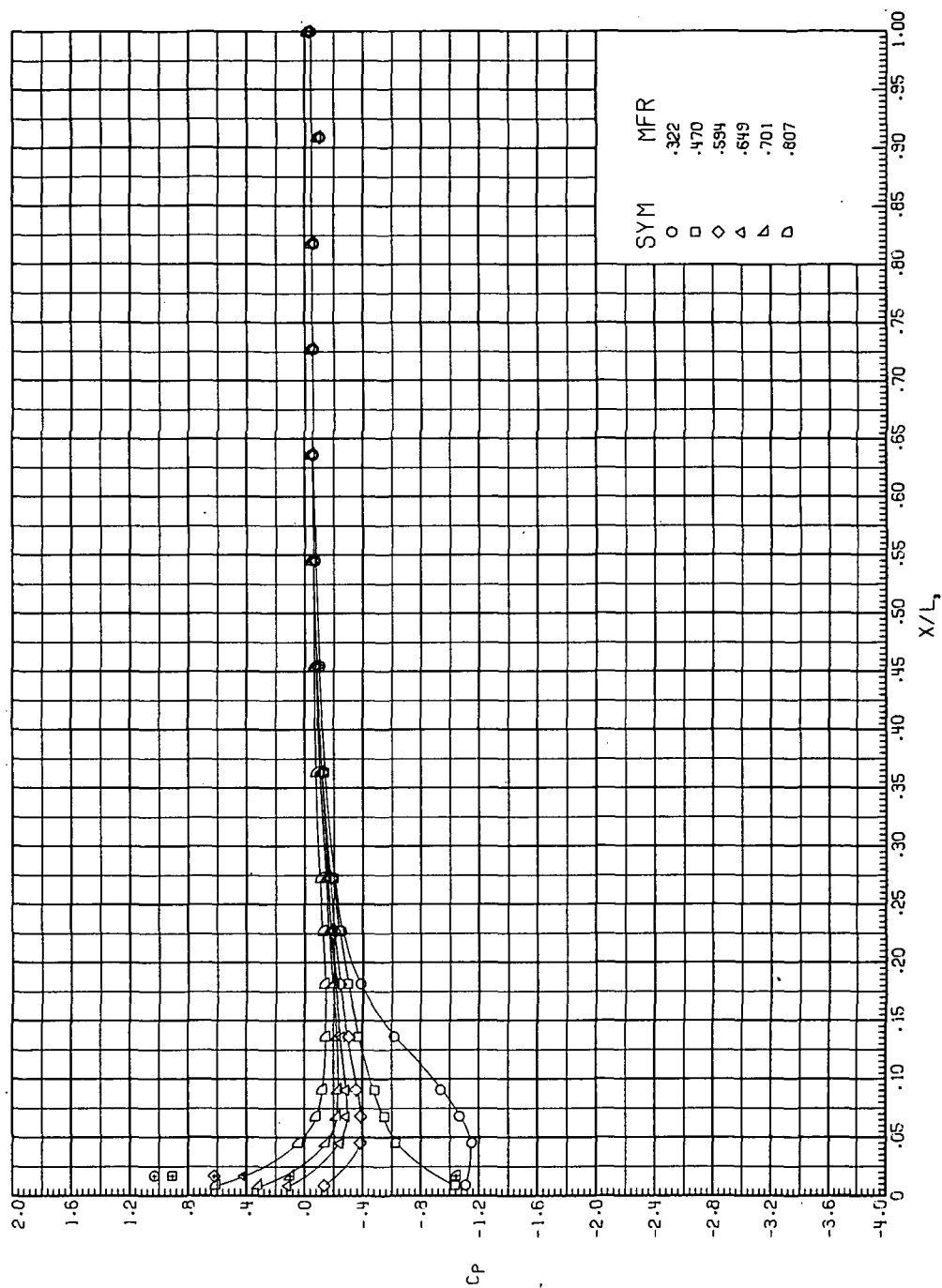
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 34. - Continued.



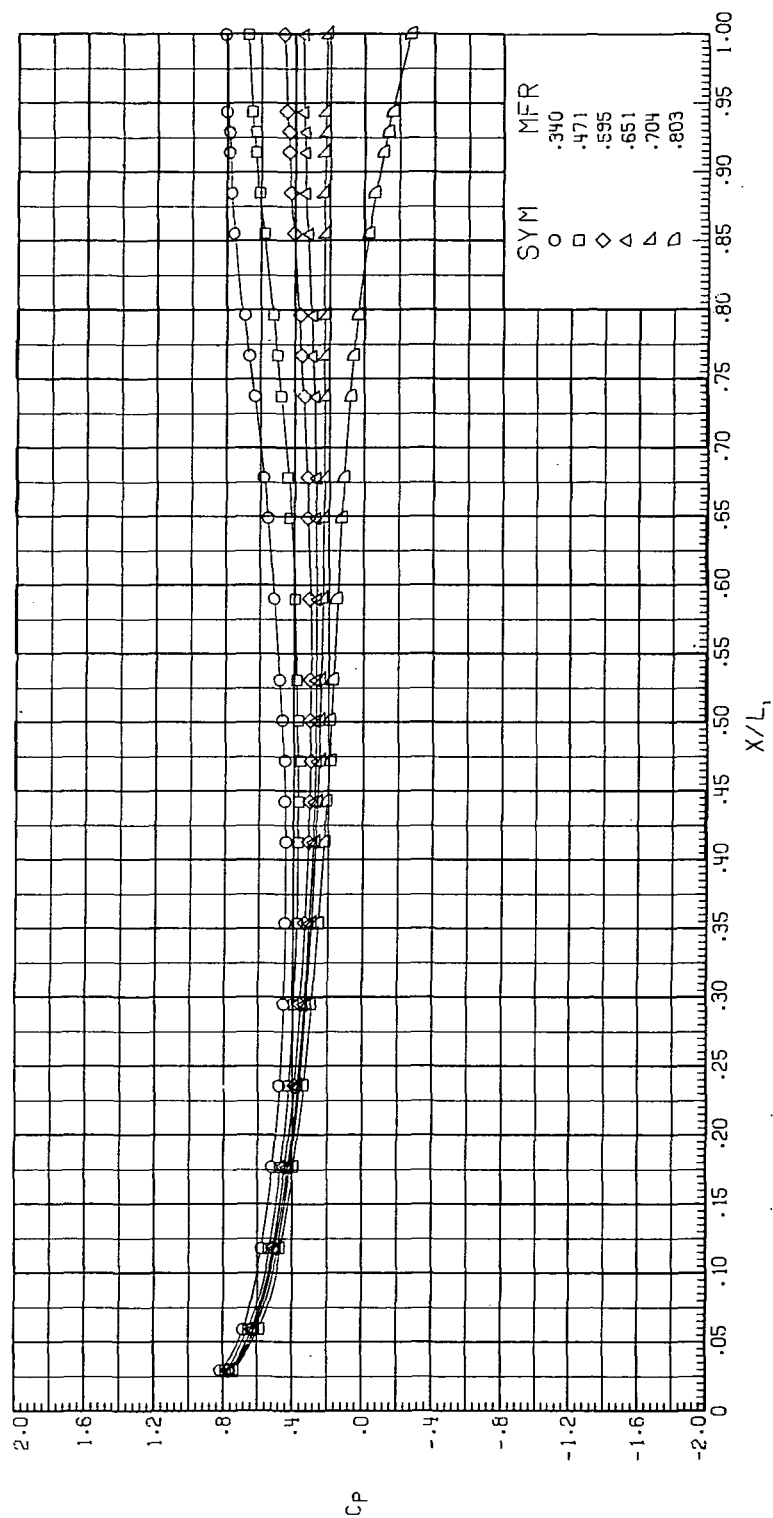
(b) $M = 0.6$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



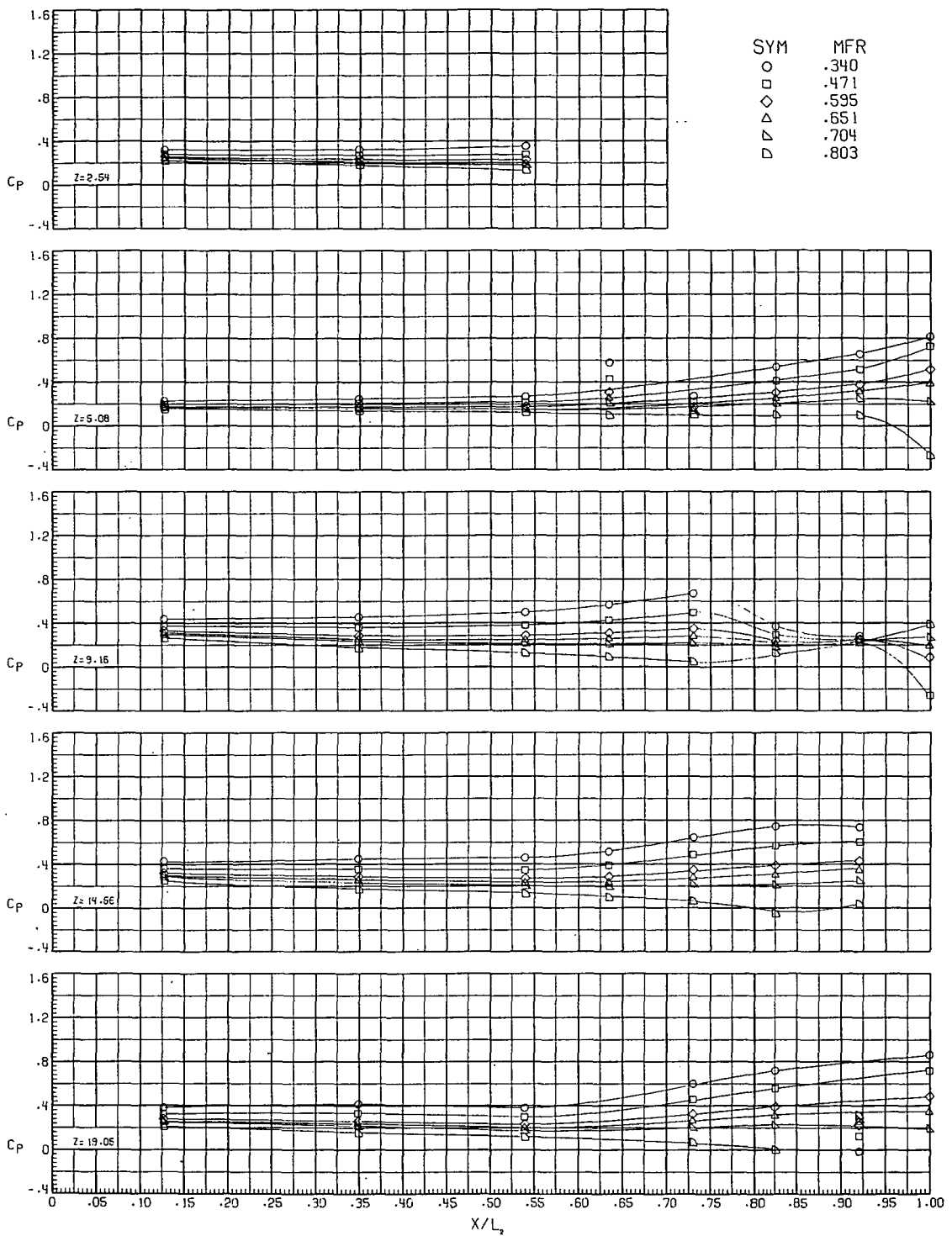
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34. - Continued.



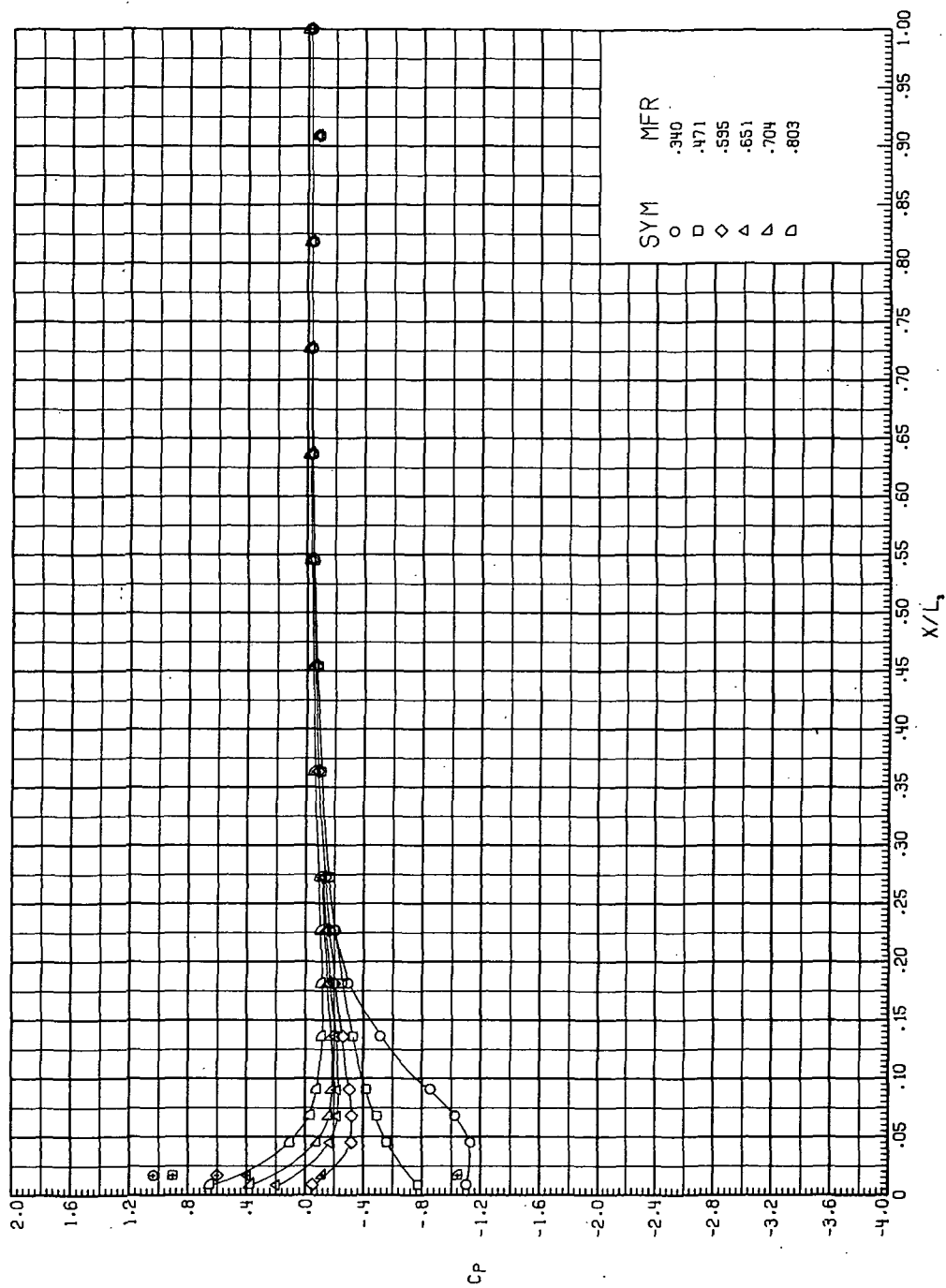
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 34.- Continued.



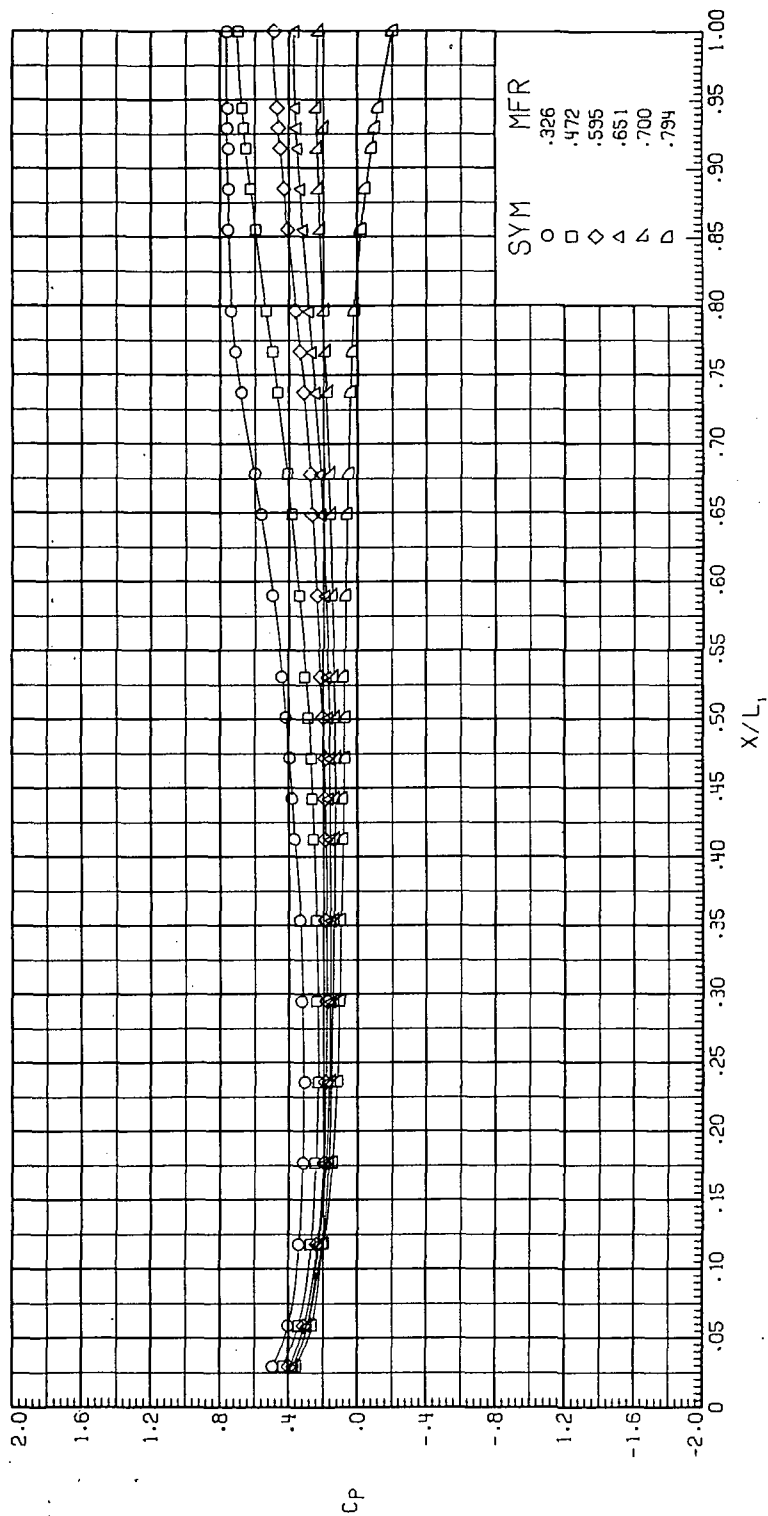
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



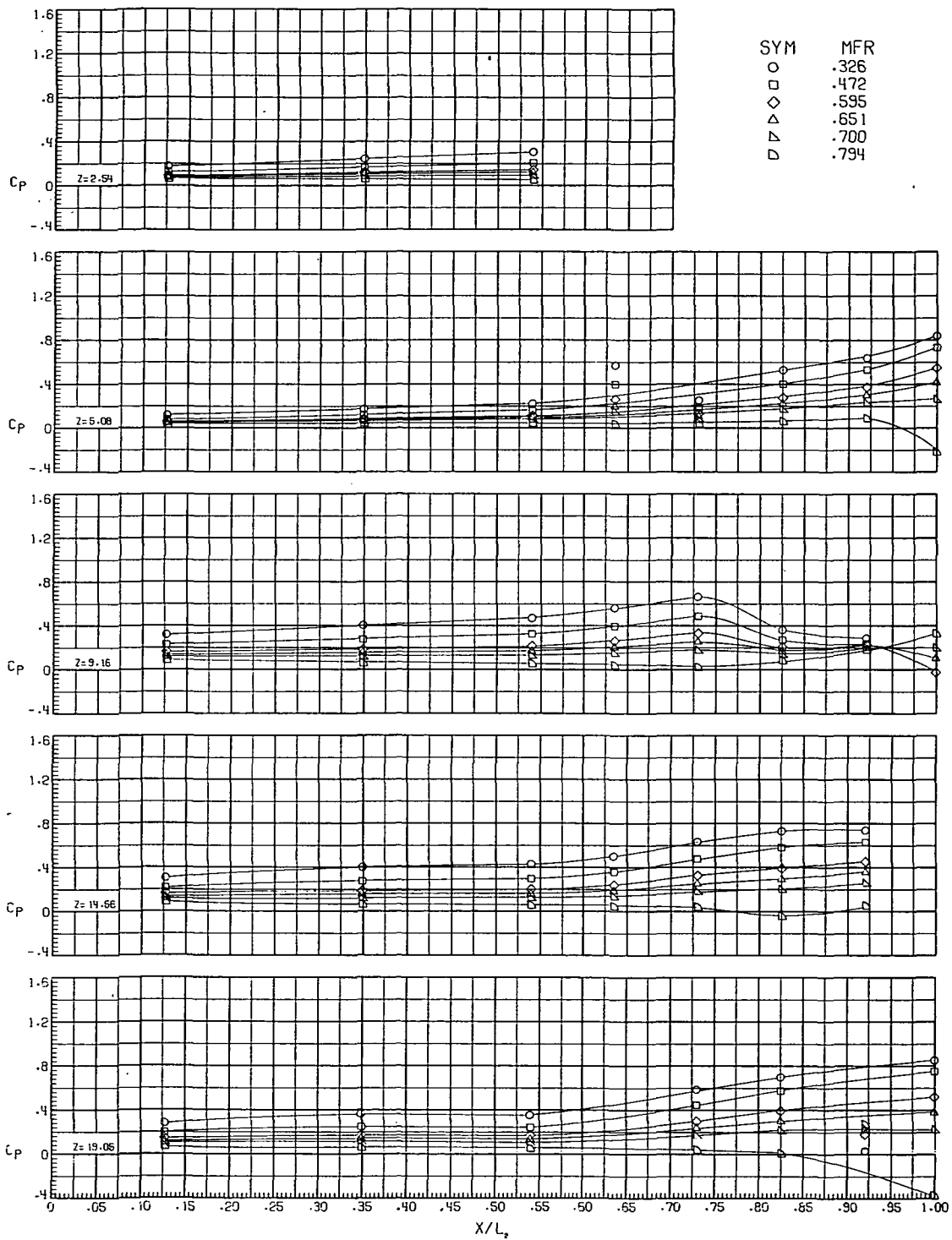
(c) $M = 0.6$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34.- Continued.



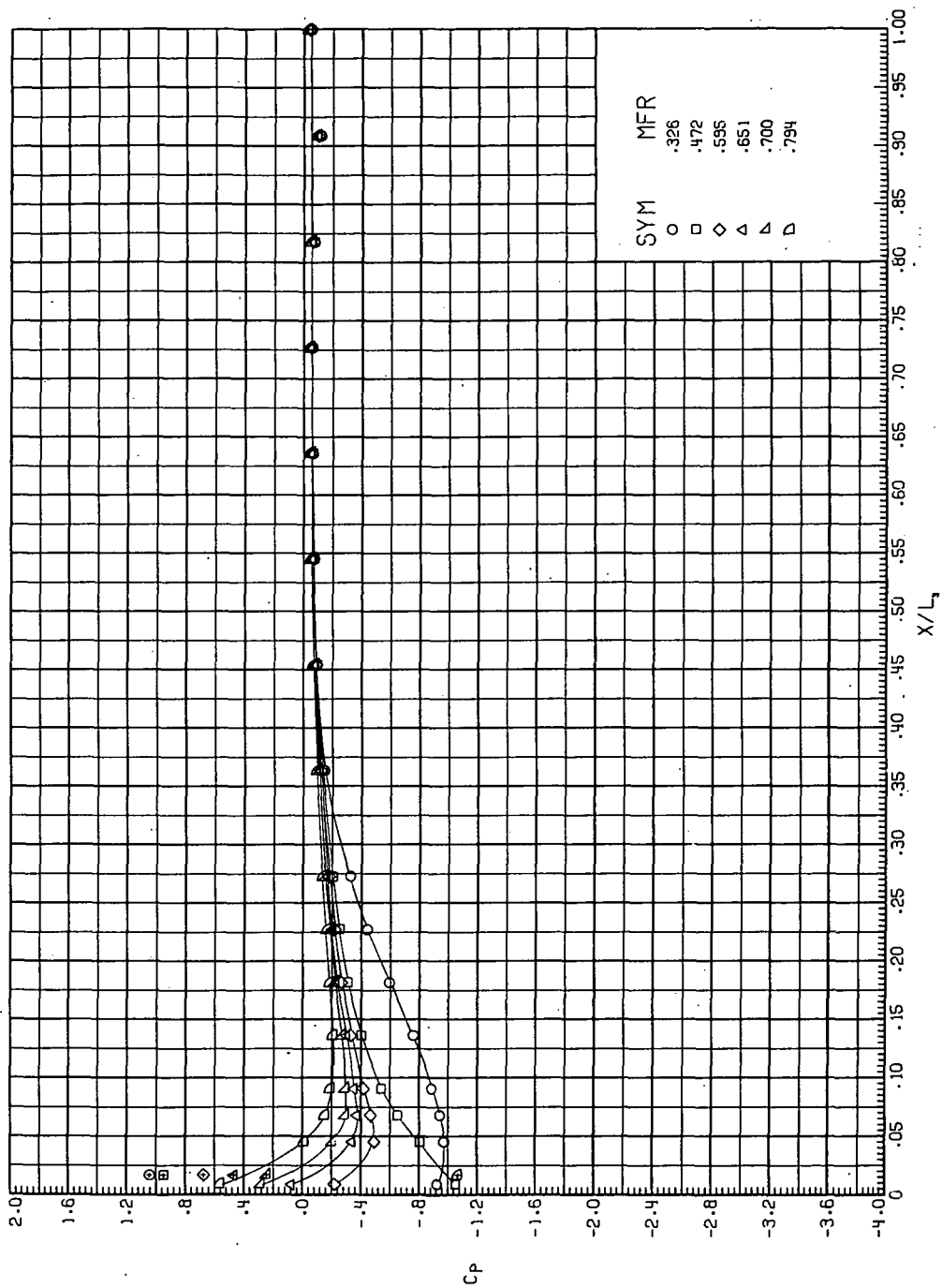
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 34.- Continued.



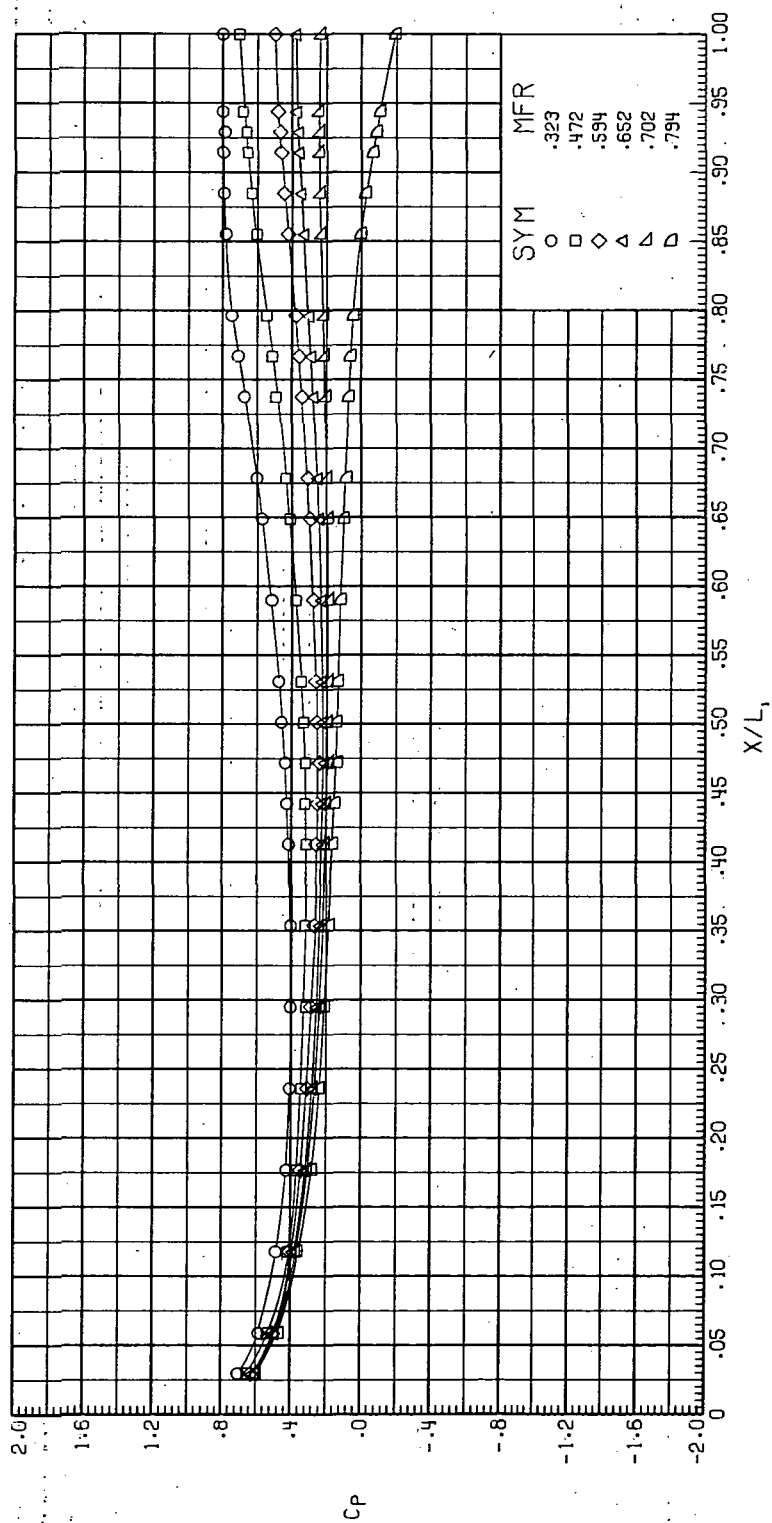
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



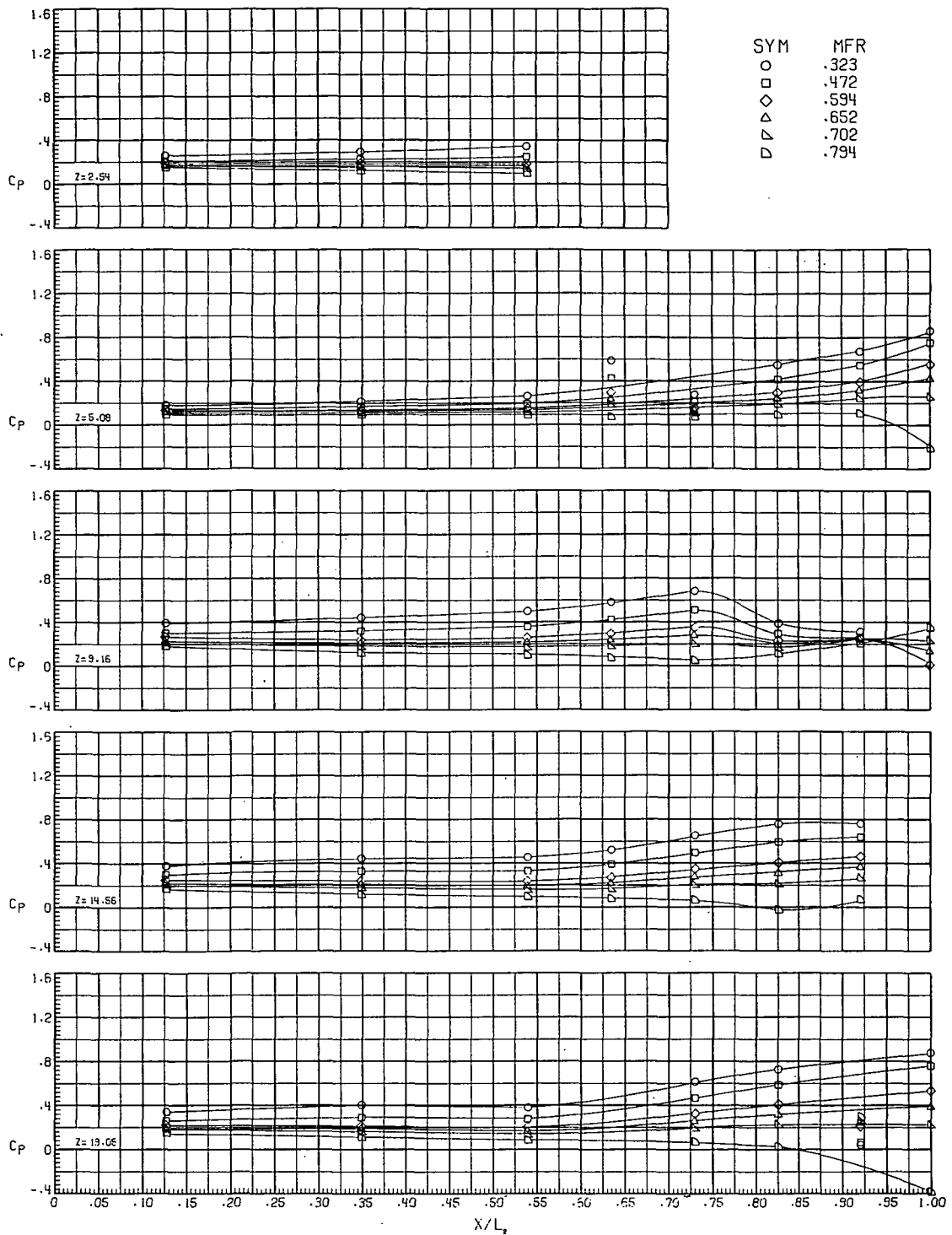
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34.- Continued.



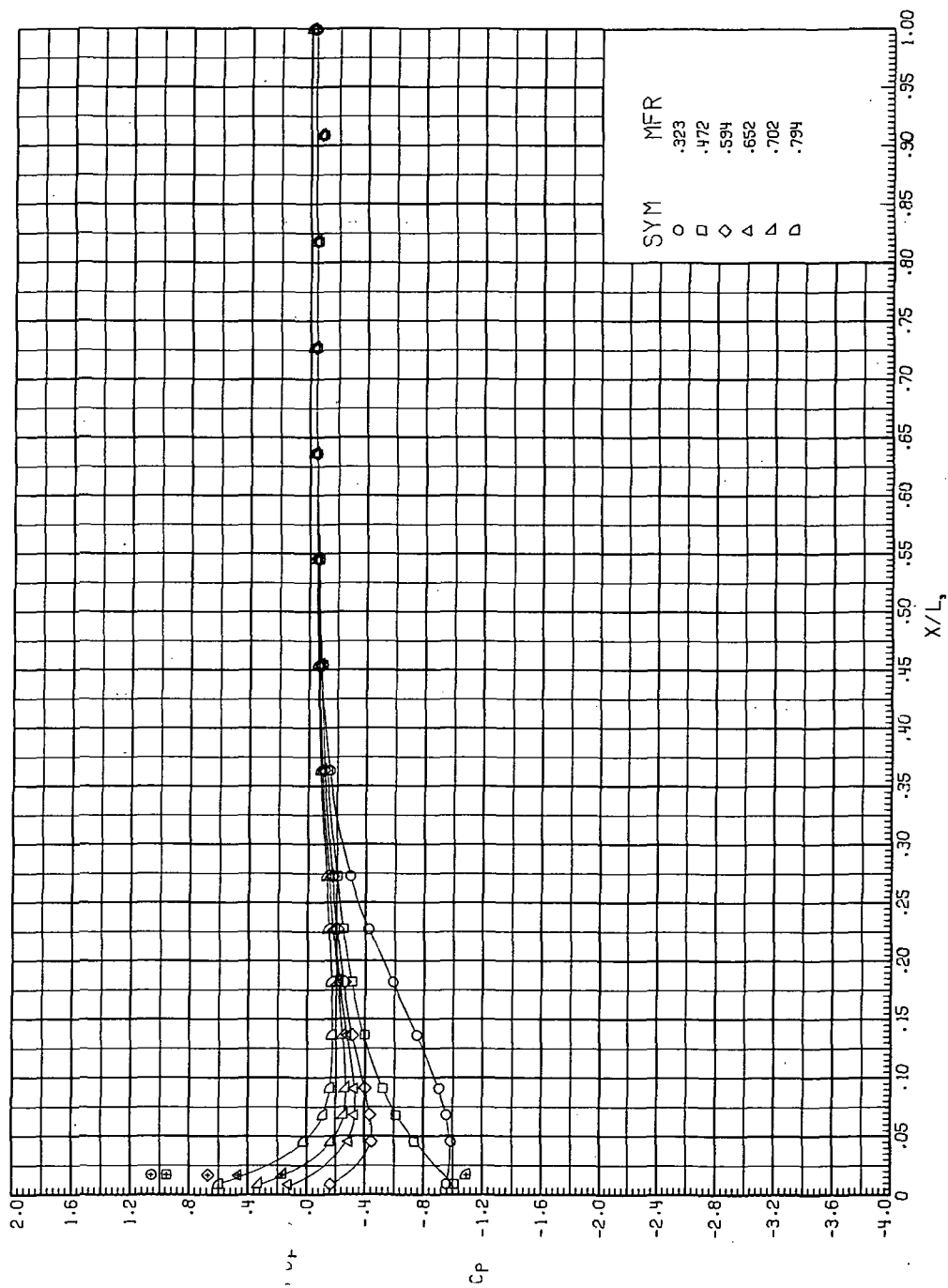
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 34. - Continued.



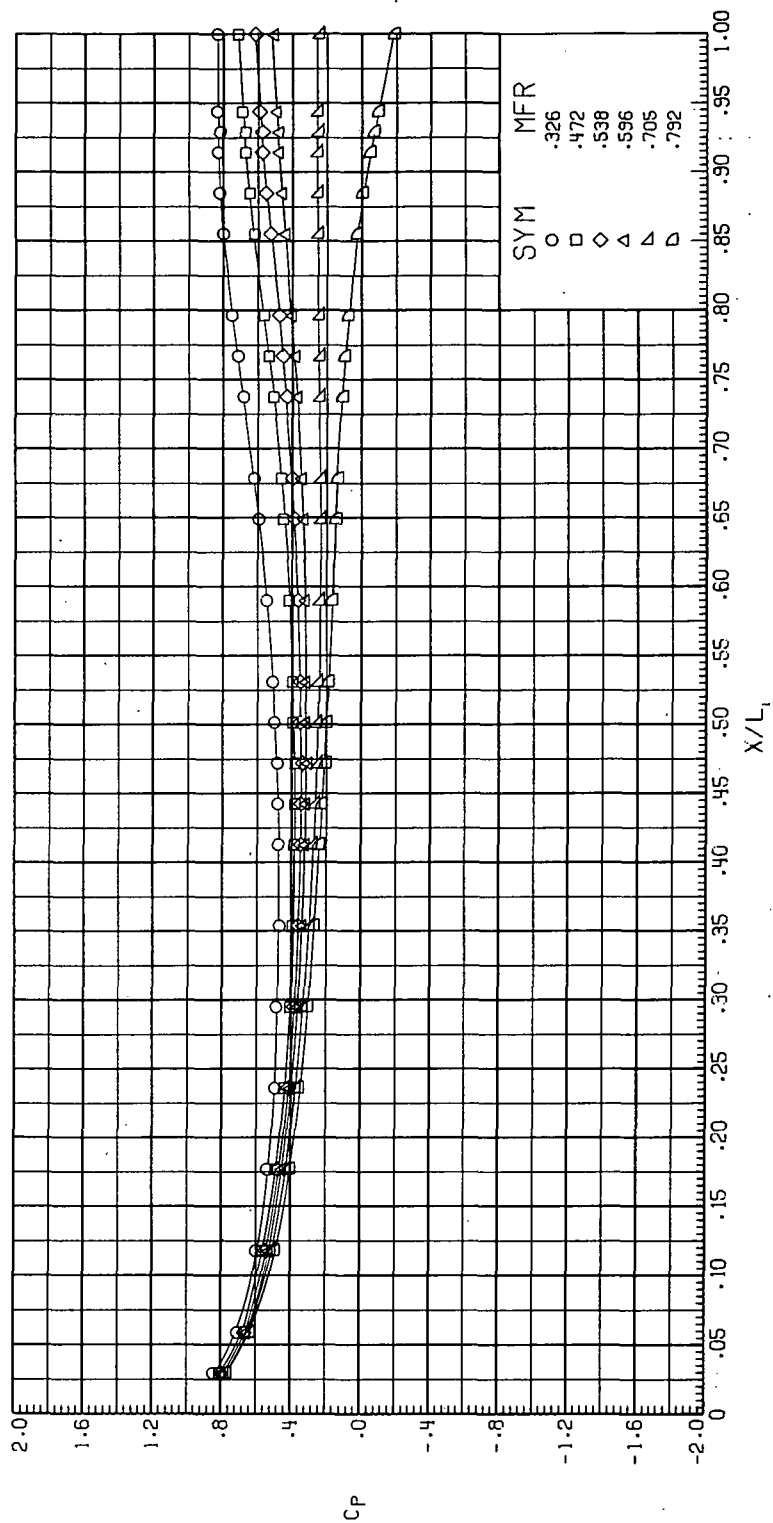
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



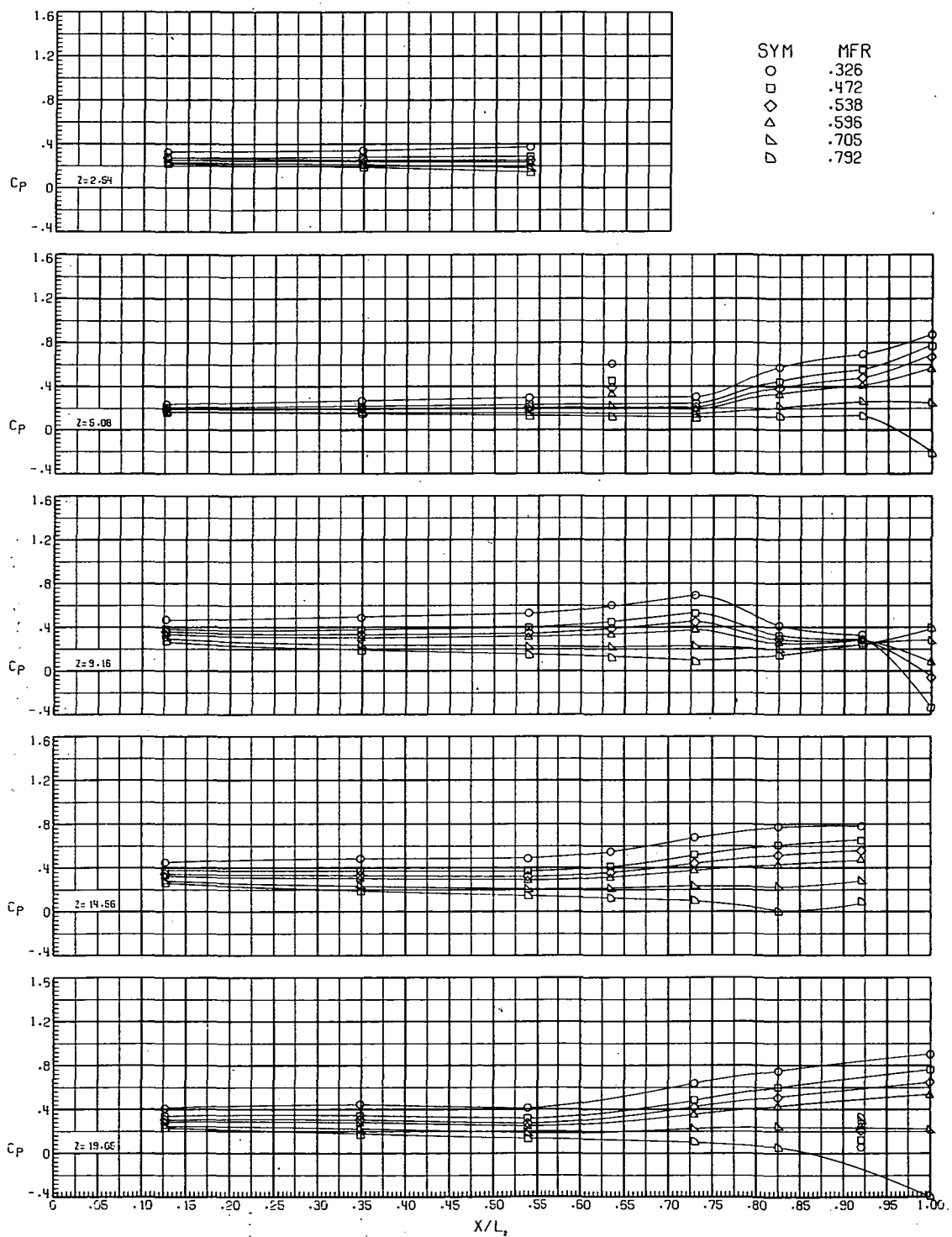
(e) $M = 0.7$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34.- Continued.



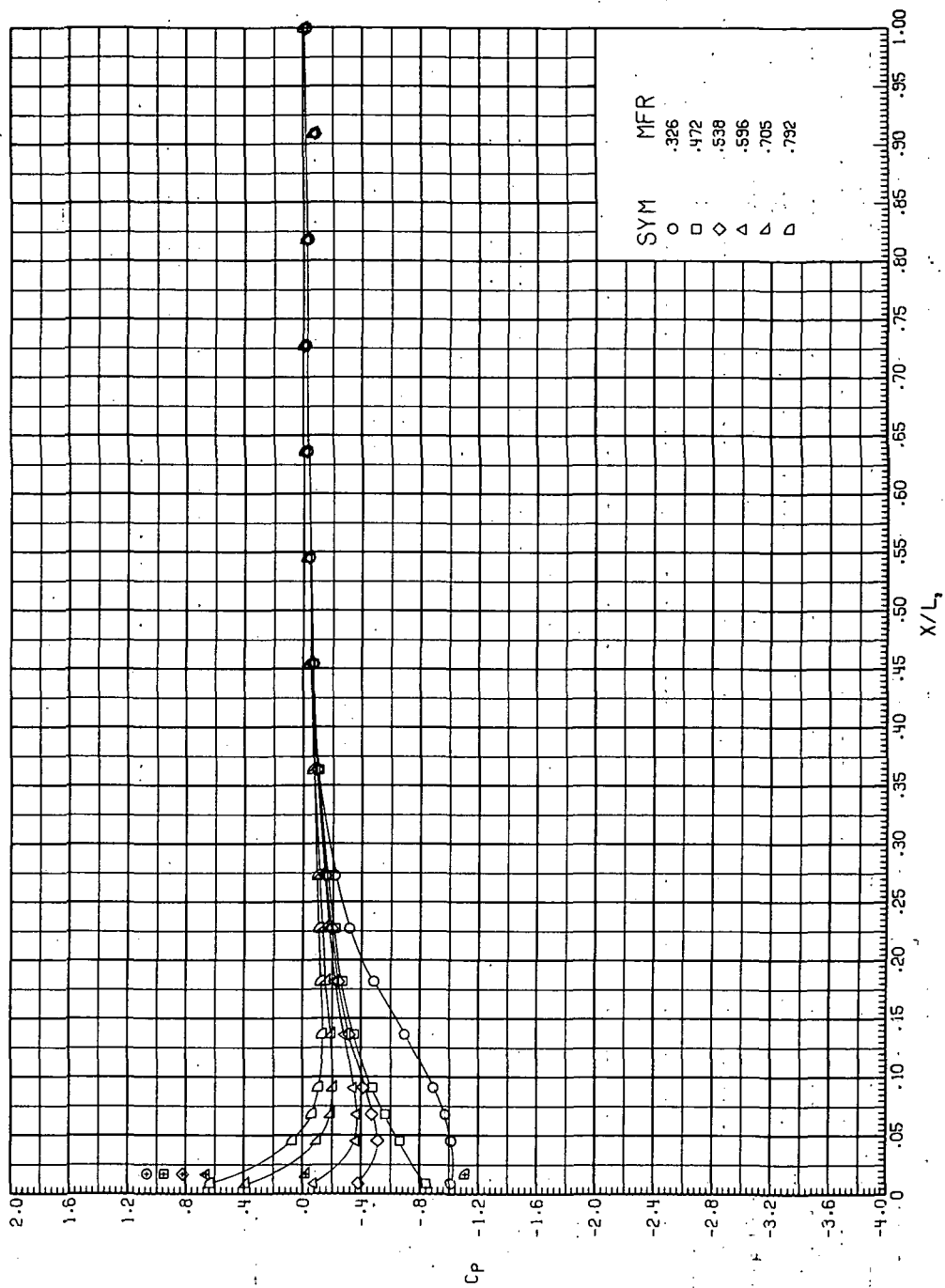
(f) $M = 0.7$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 34.- Continued.



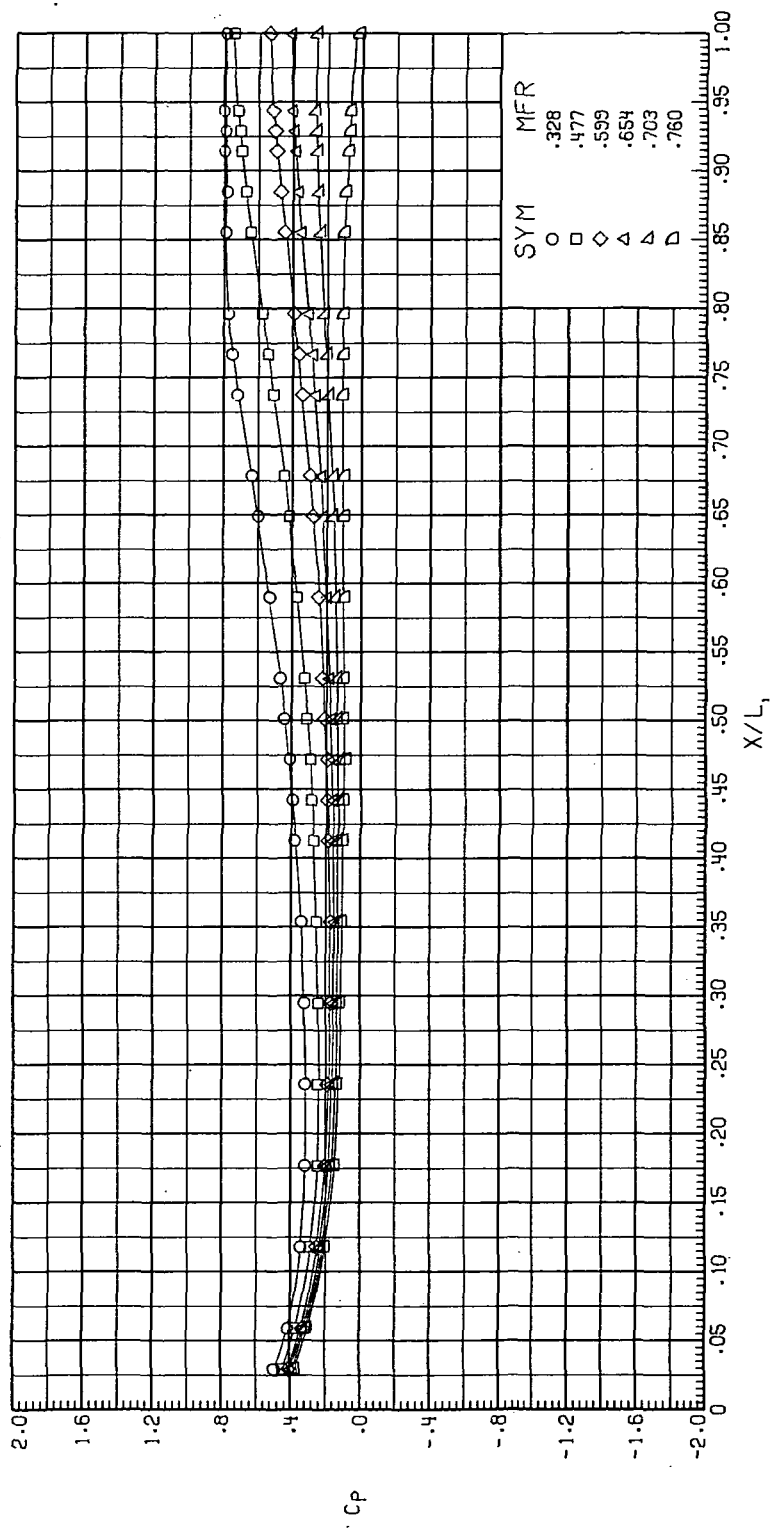
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



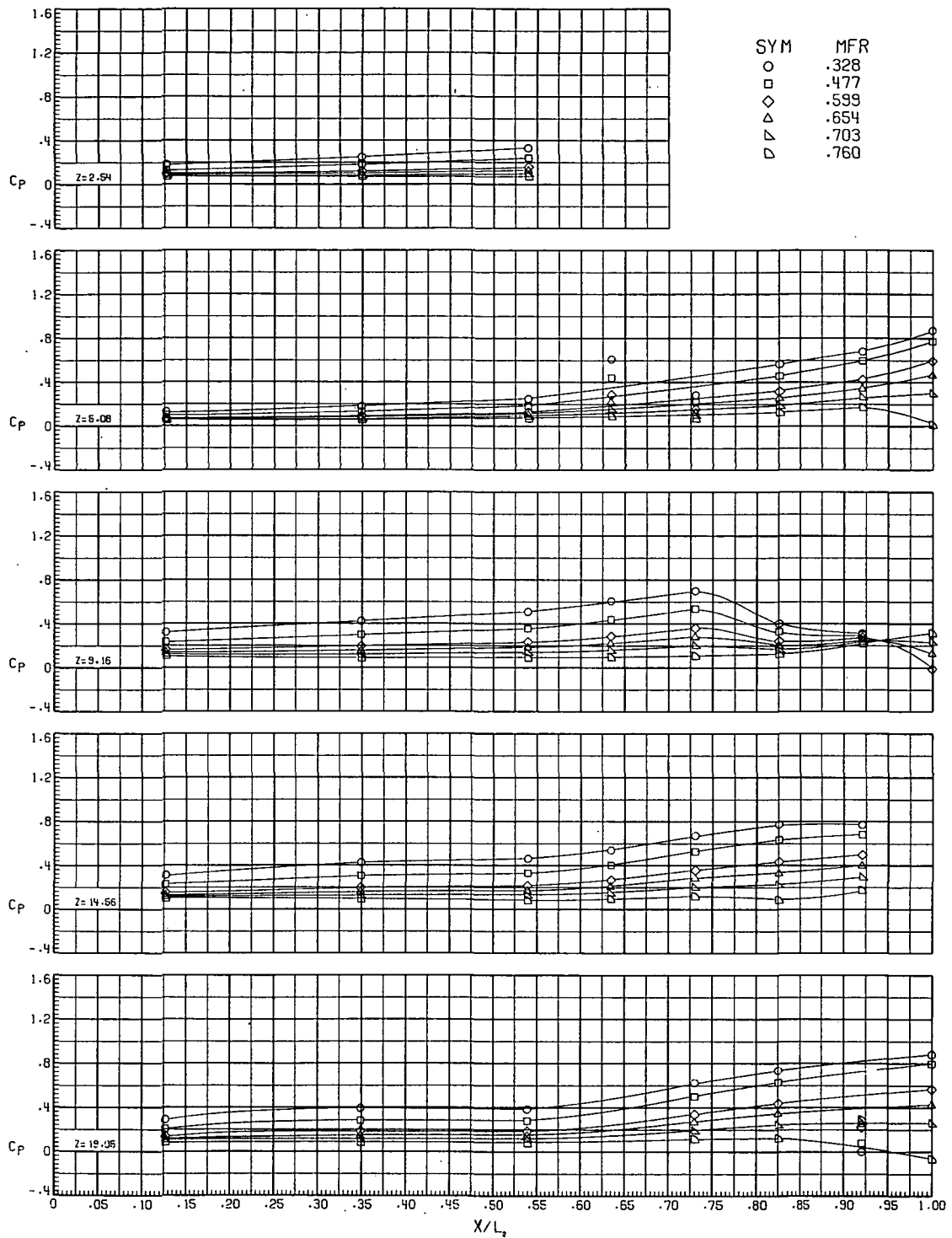
(f) $M = 0.7$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34.- Continued.



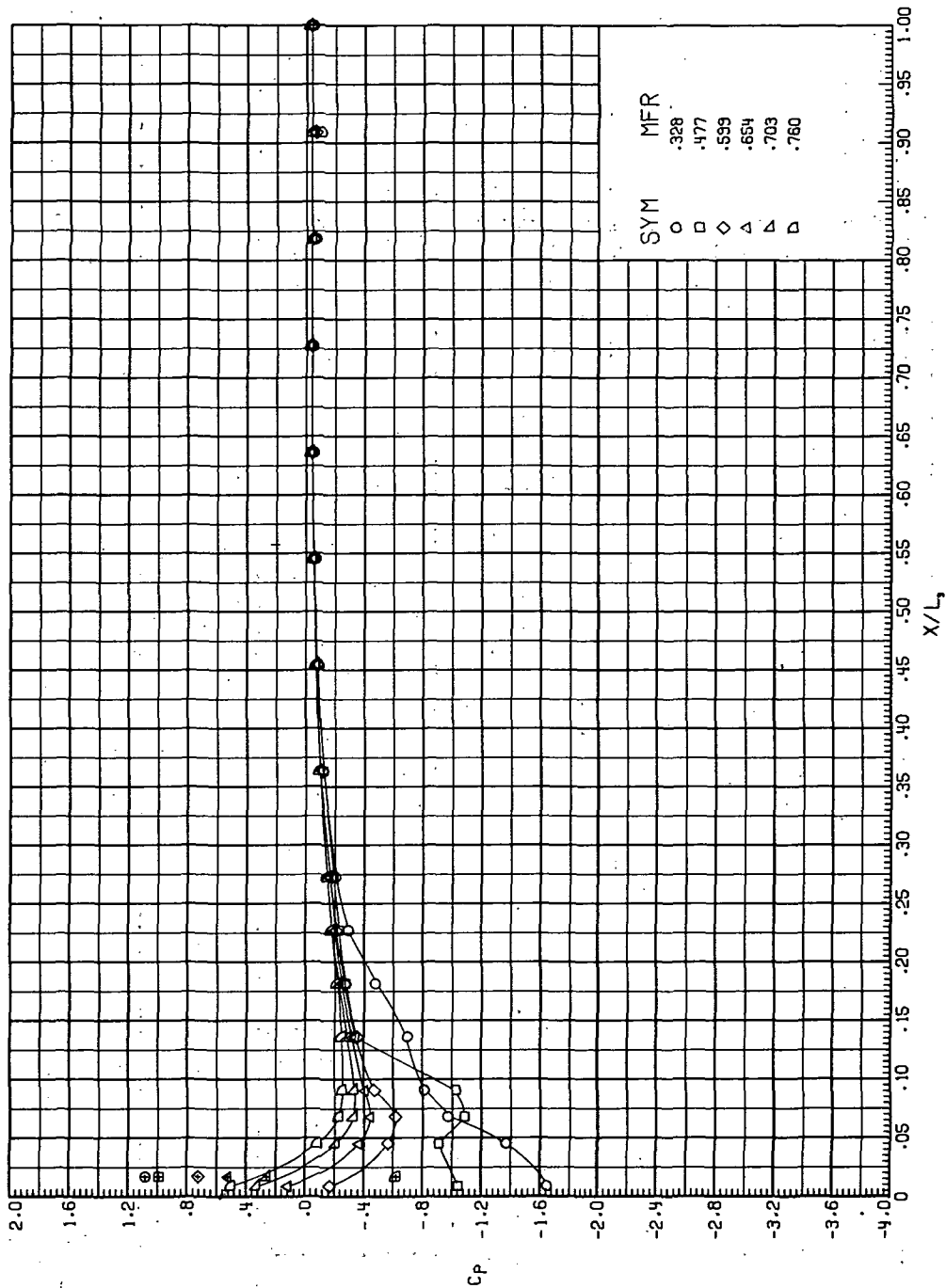
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 34. - Continued.



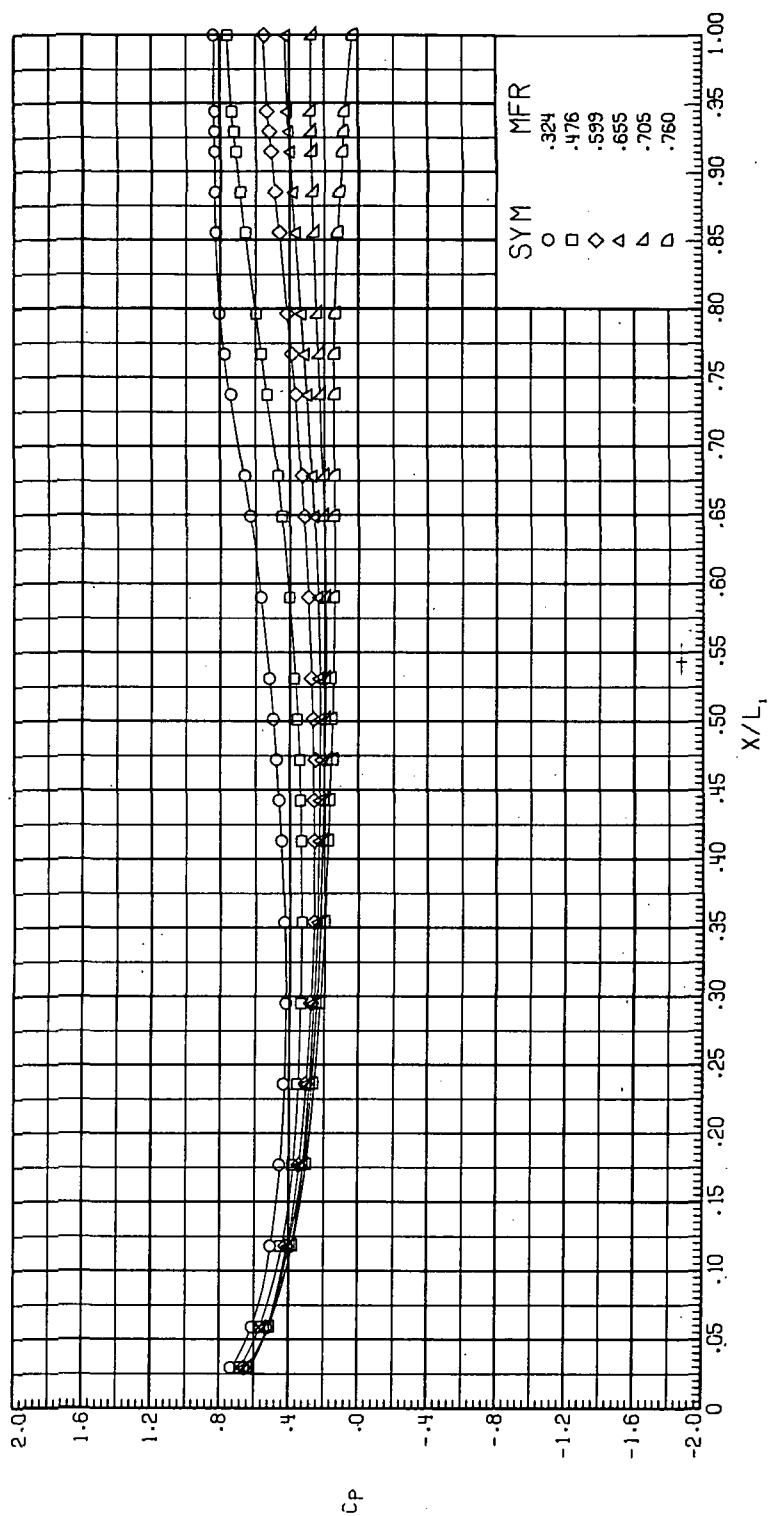
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



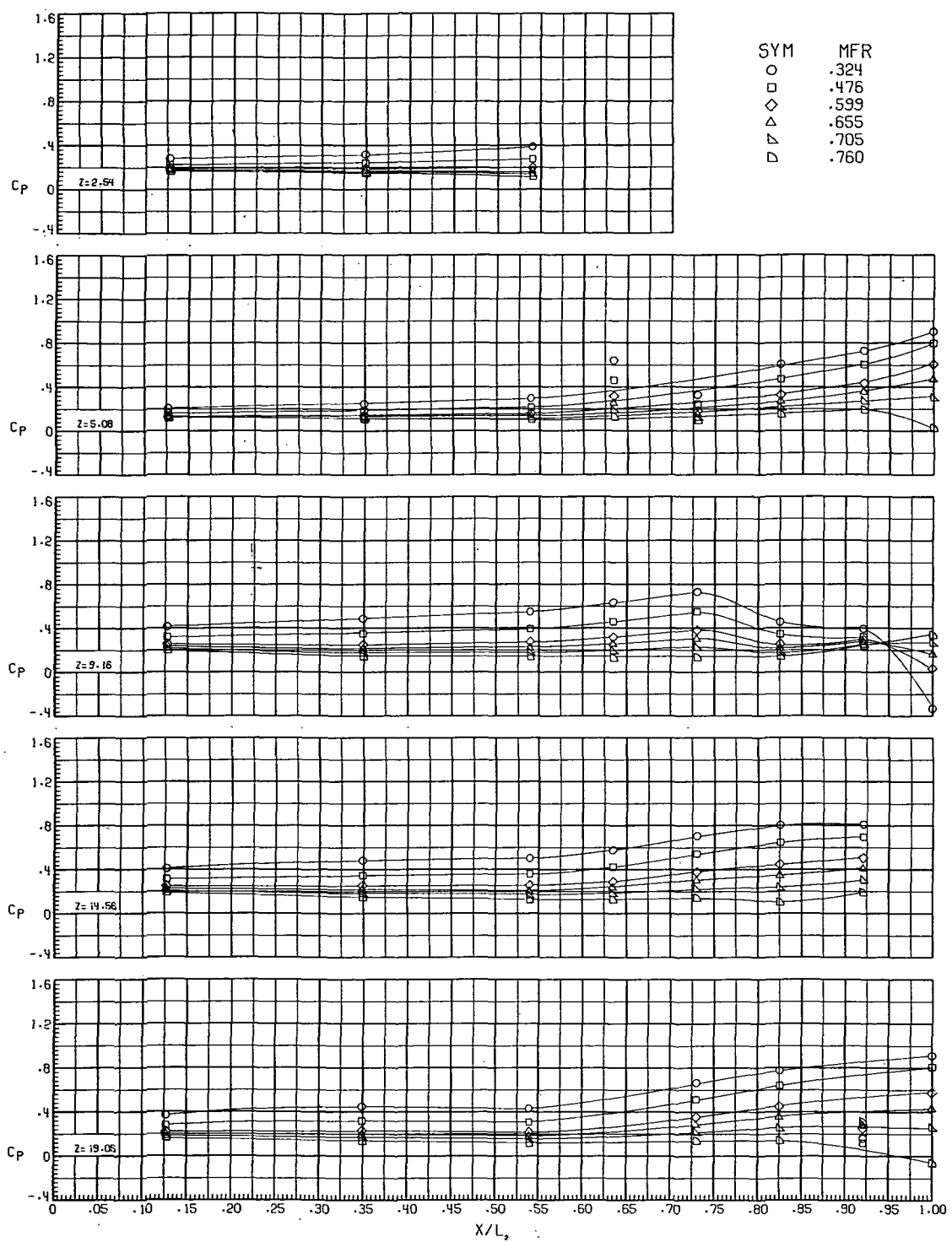
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34. - Continued.



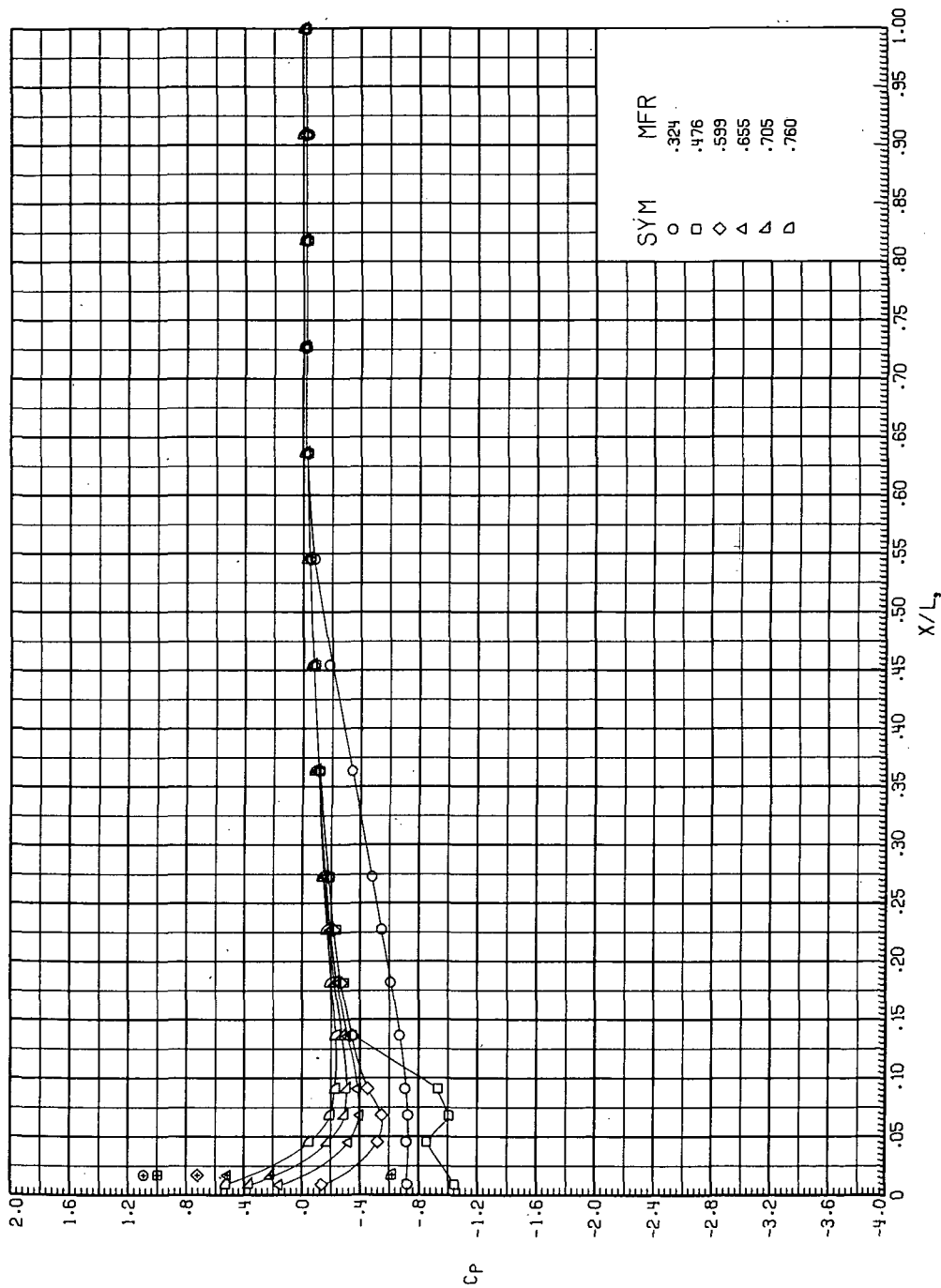
(h) $M = 0.8$; $\alpha = 40^\circ$; ramp pressure coefficients.

Figure 34.- Continued.



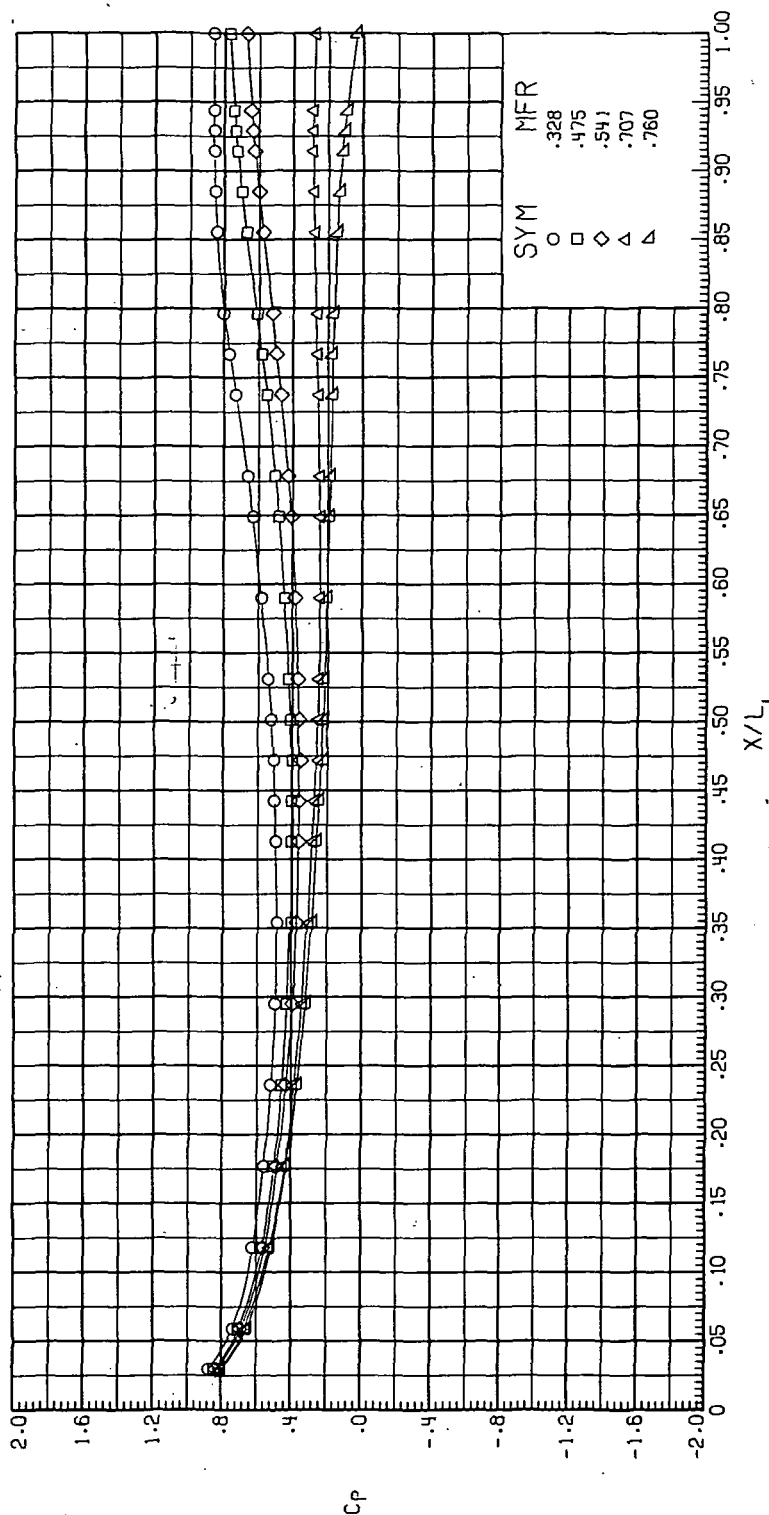
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



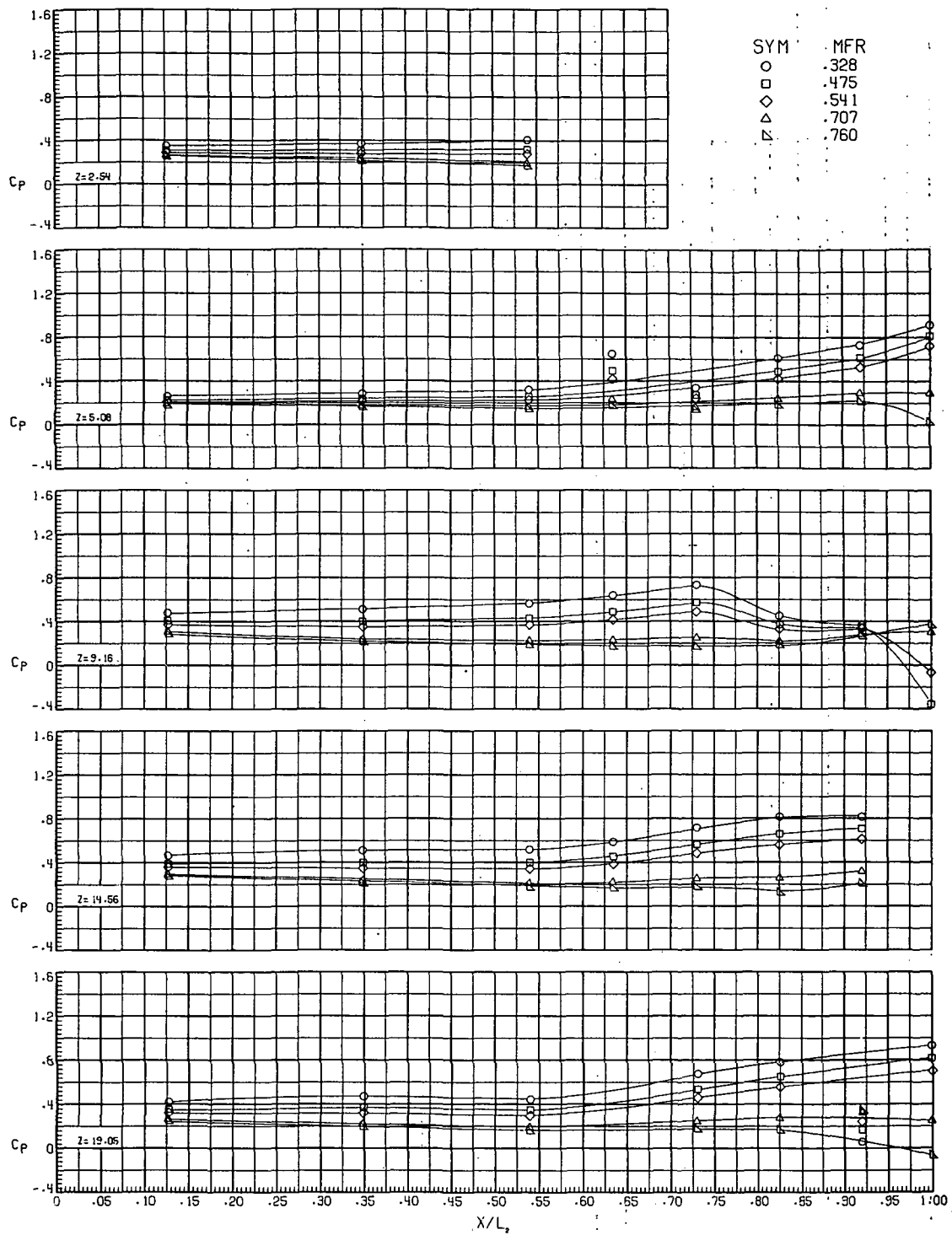
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34. - Continued.



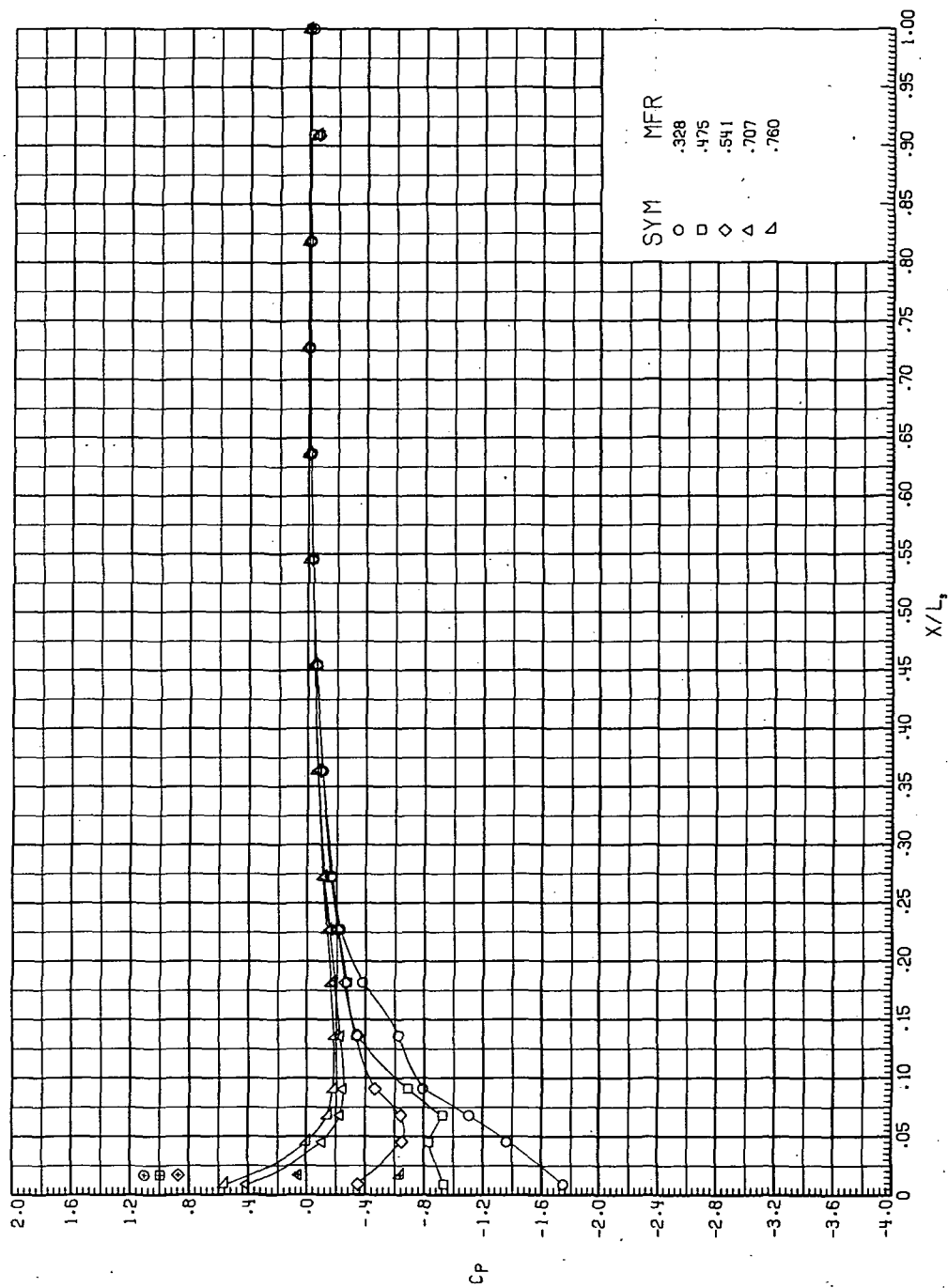
(i) $M = 0.8$; $\alpha = 80^\circ$; ramp pressure coefficients.

Figure 34.- Continued.



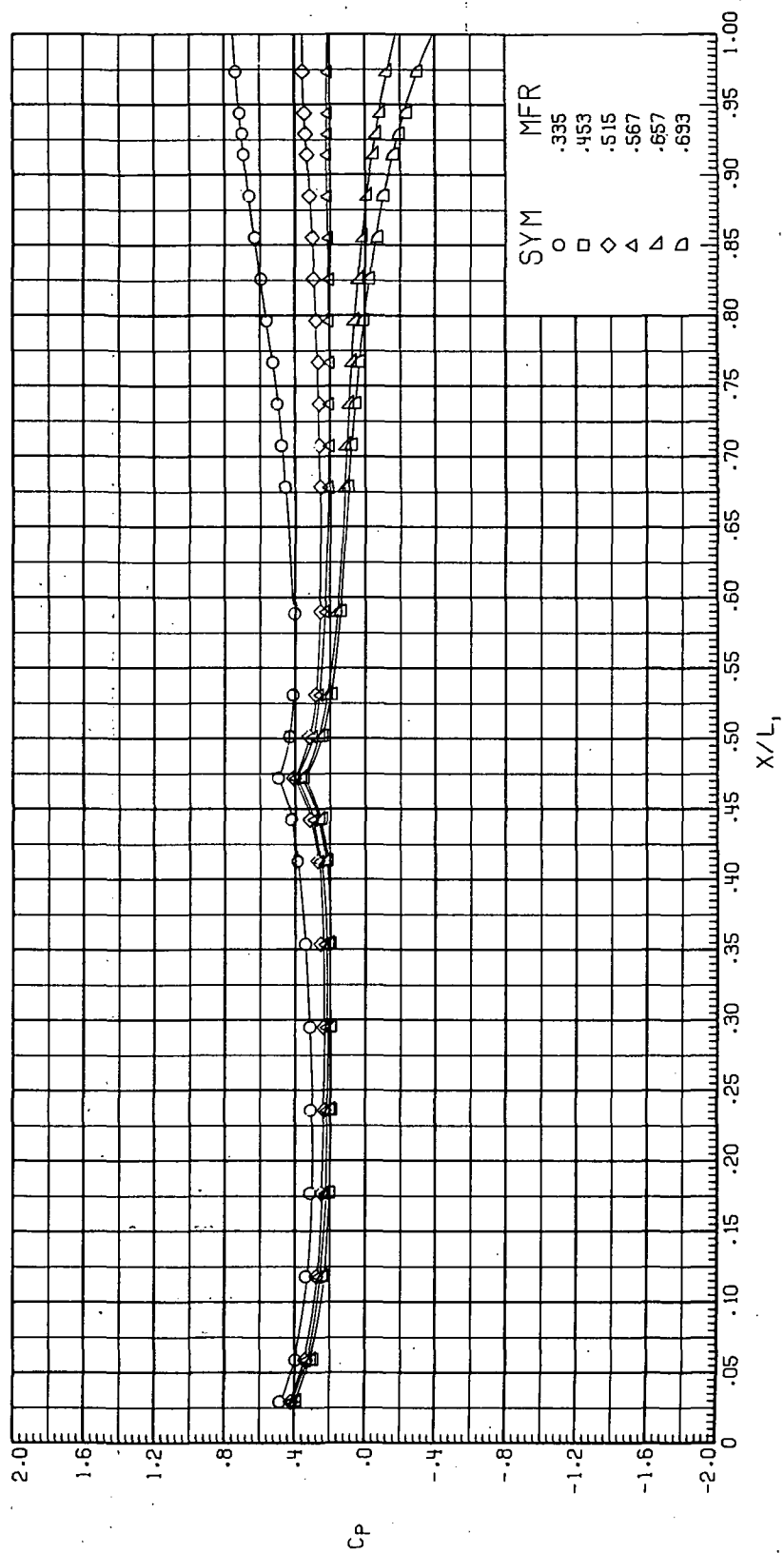
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 34.- Continued.



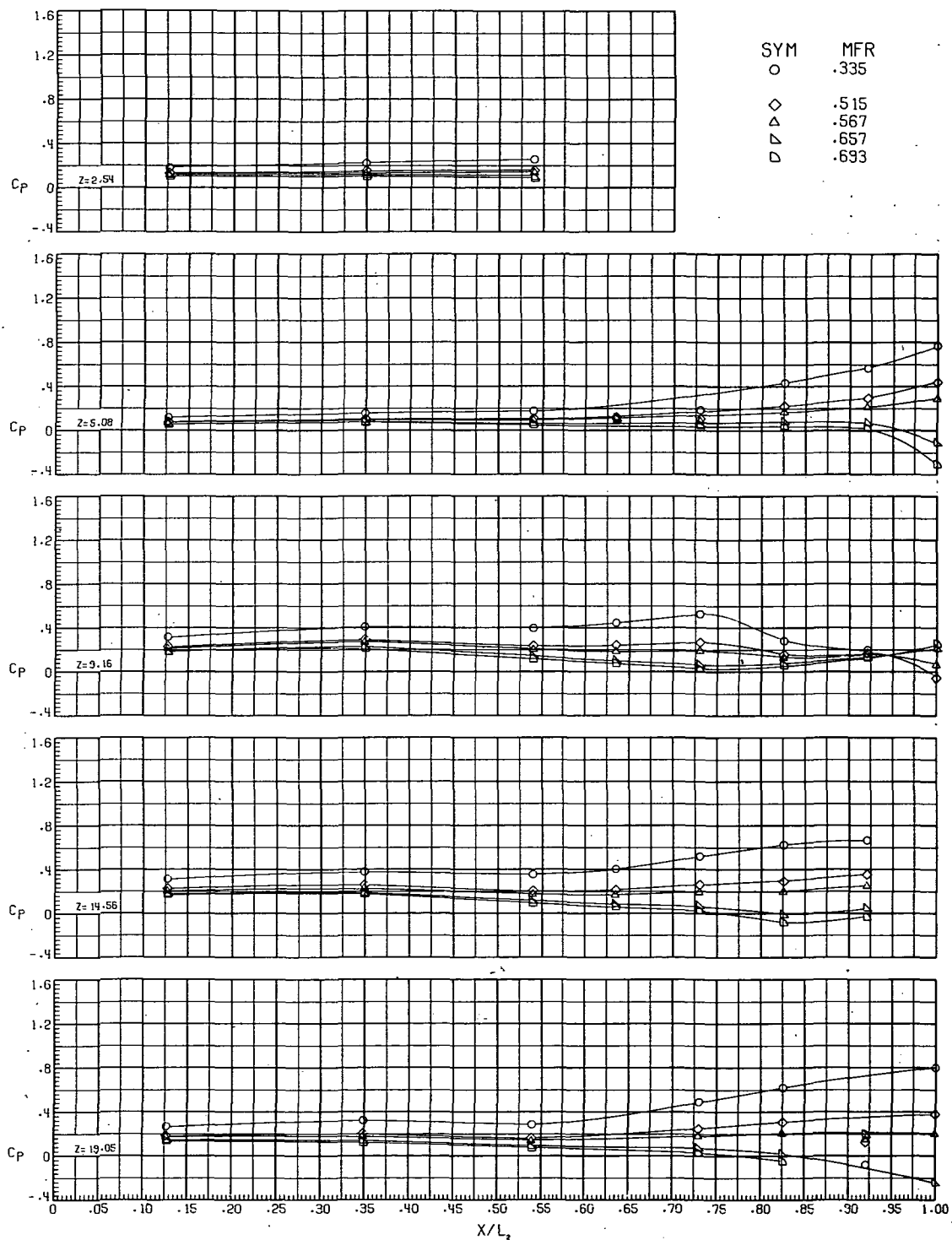
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 34.- Concluded.



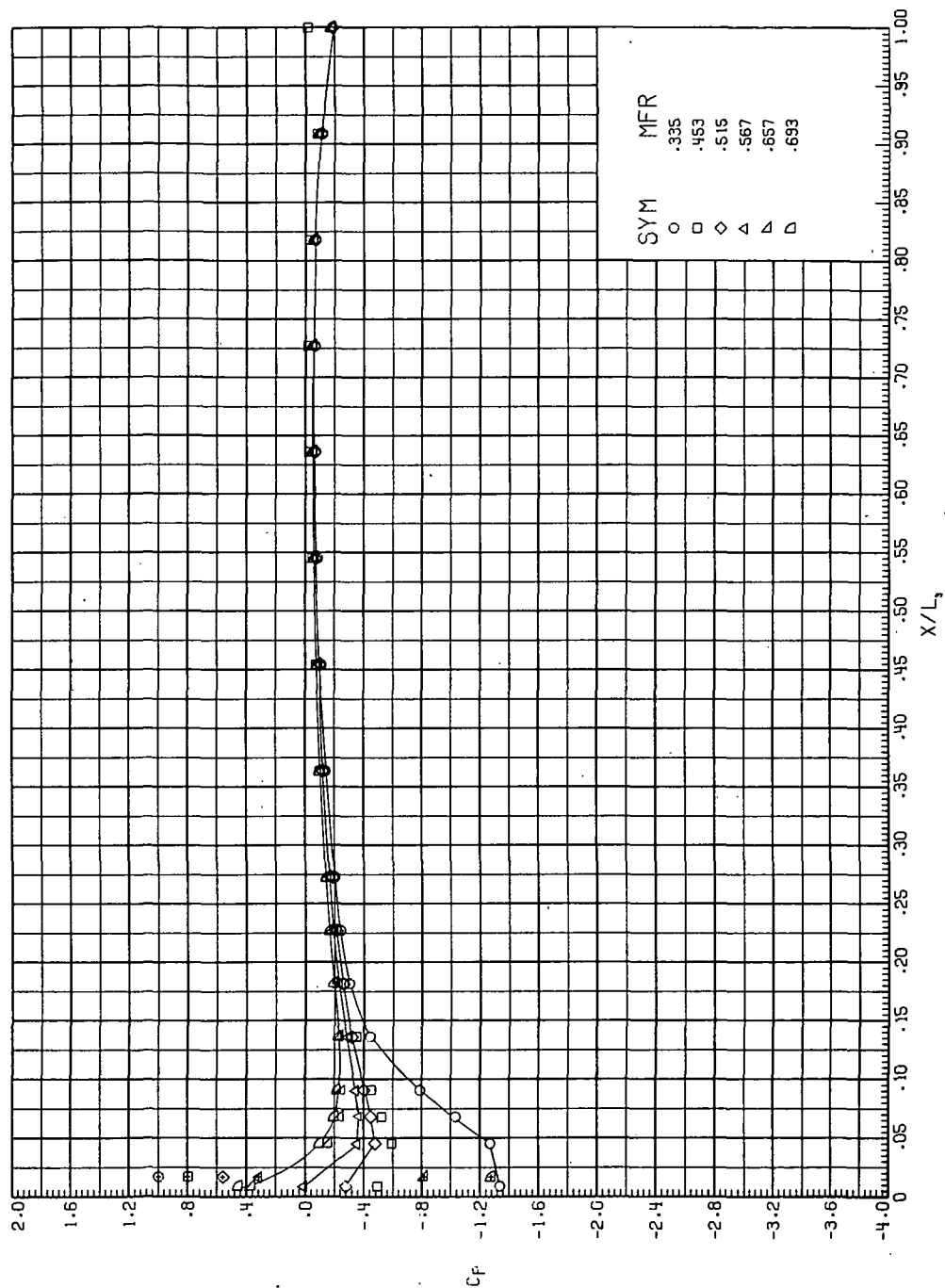
(a) $M = 0.6$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 35.- Pressure coefficients for cowl 45-0. $\delta_1 = 5^\circ$; $\delta_2 = 10^\circ$.



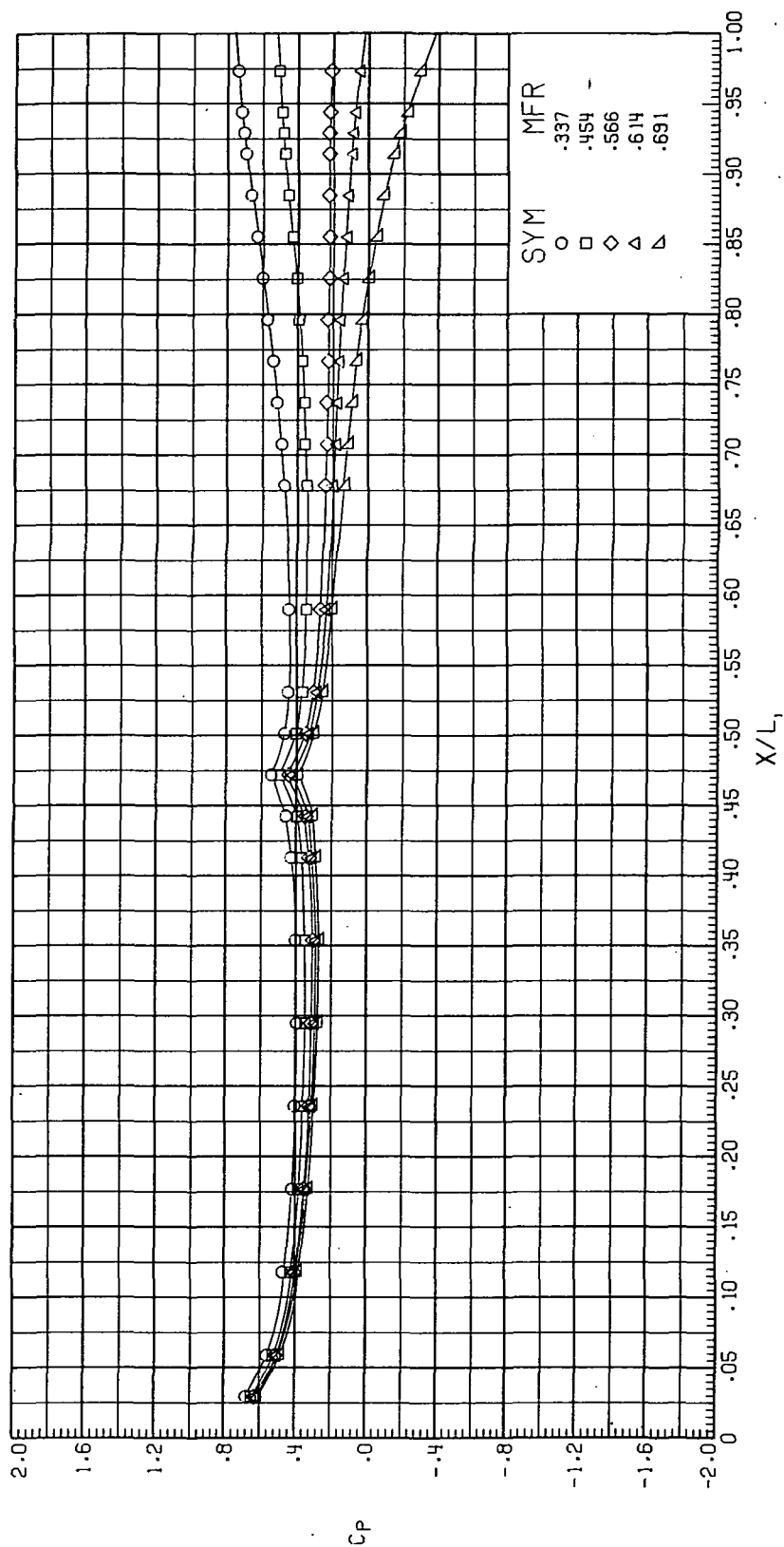
(a) $M = 0.6$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



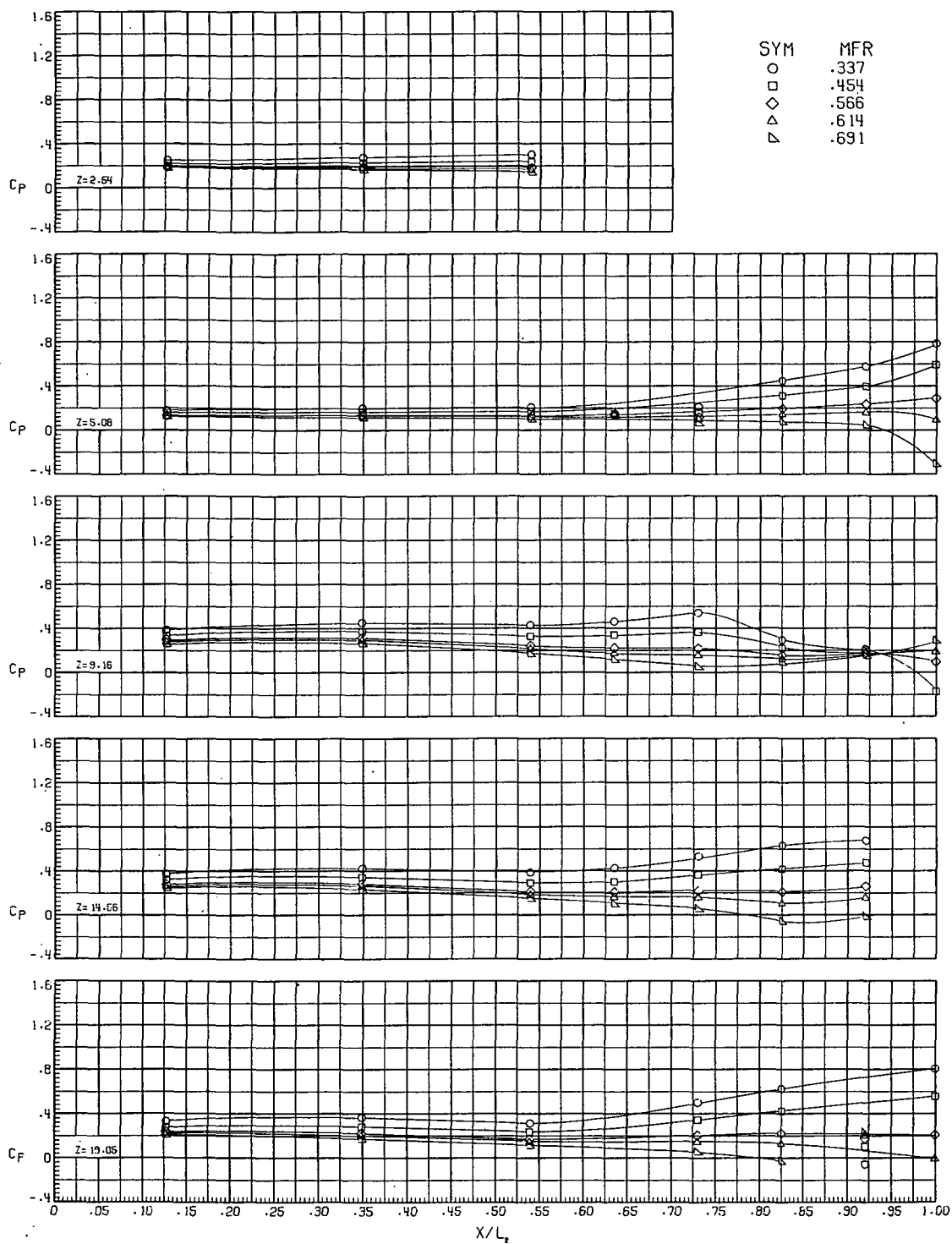
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35.- Continued.



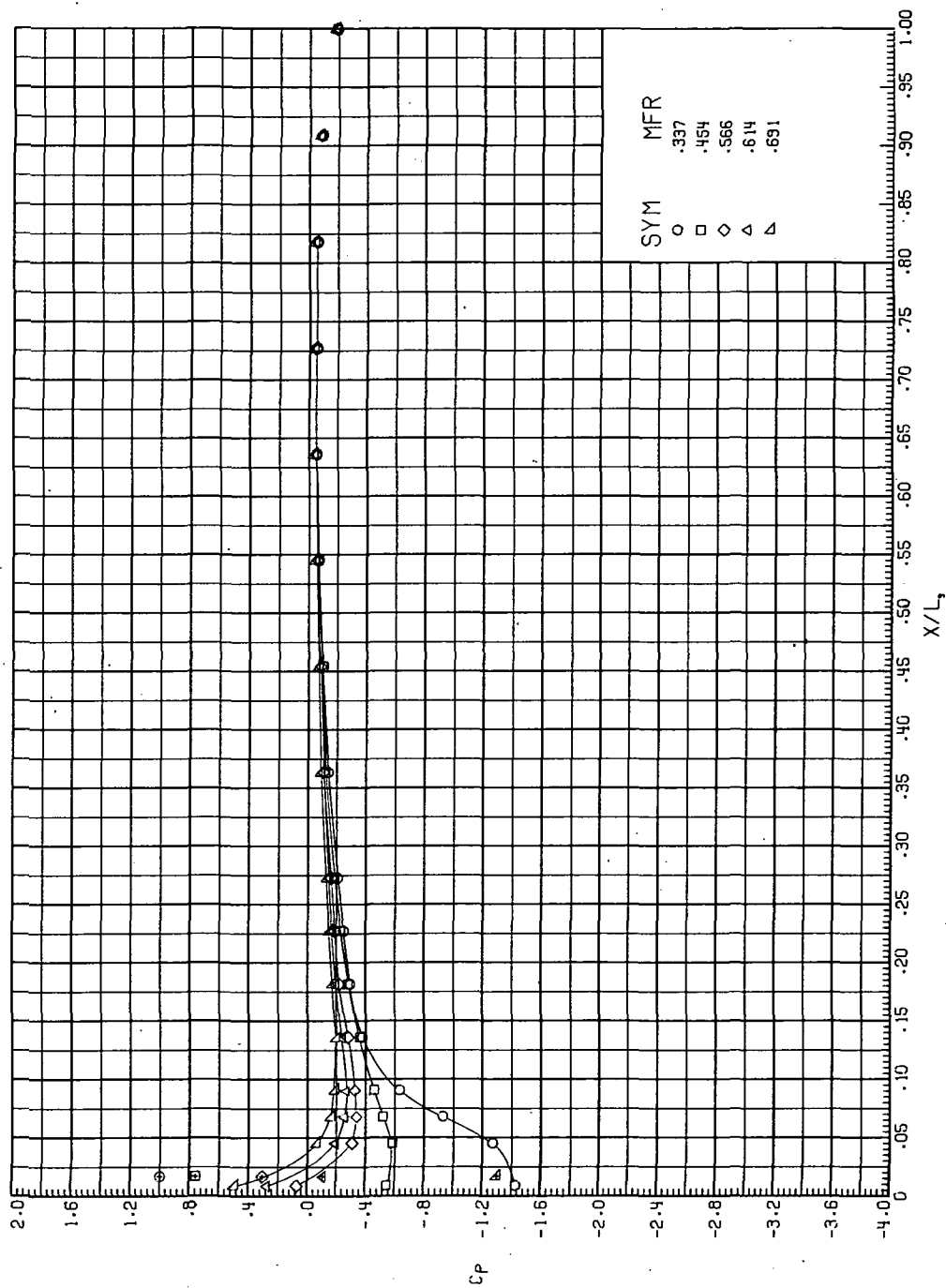
(b) $M = 0.6$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



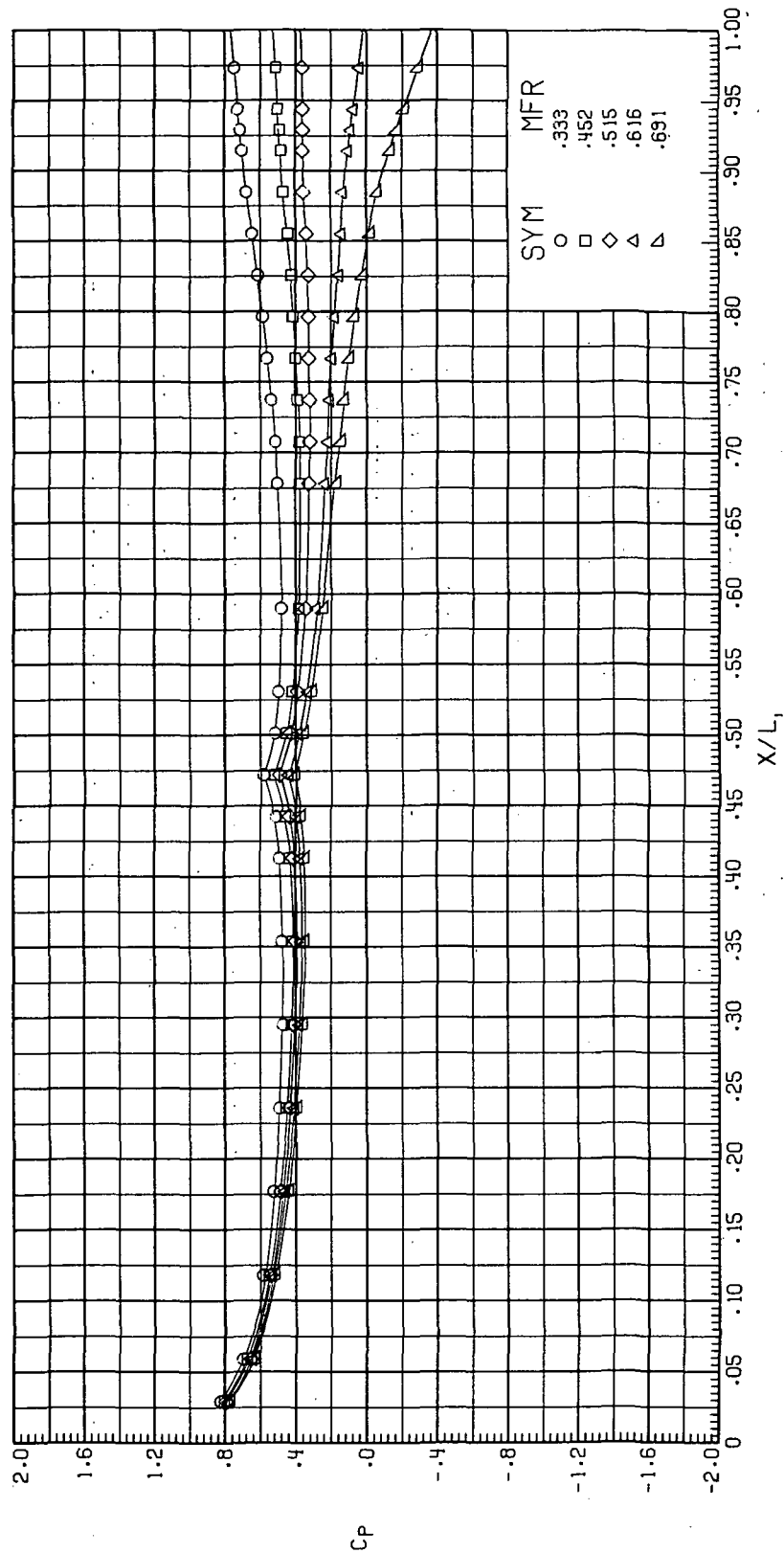
(b) $M = 0.6$; $\alpha = 40^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



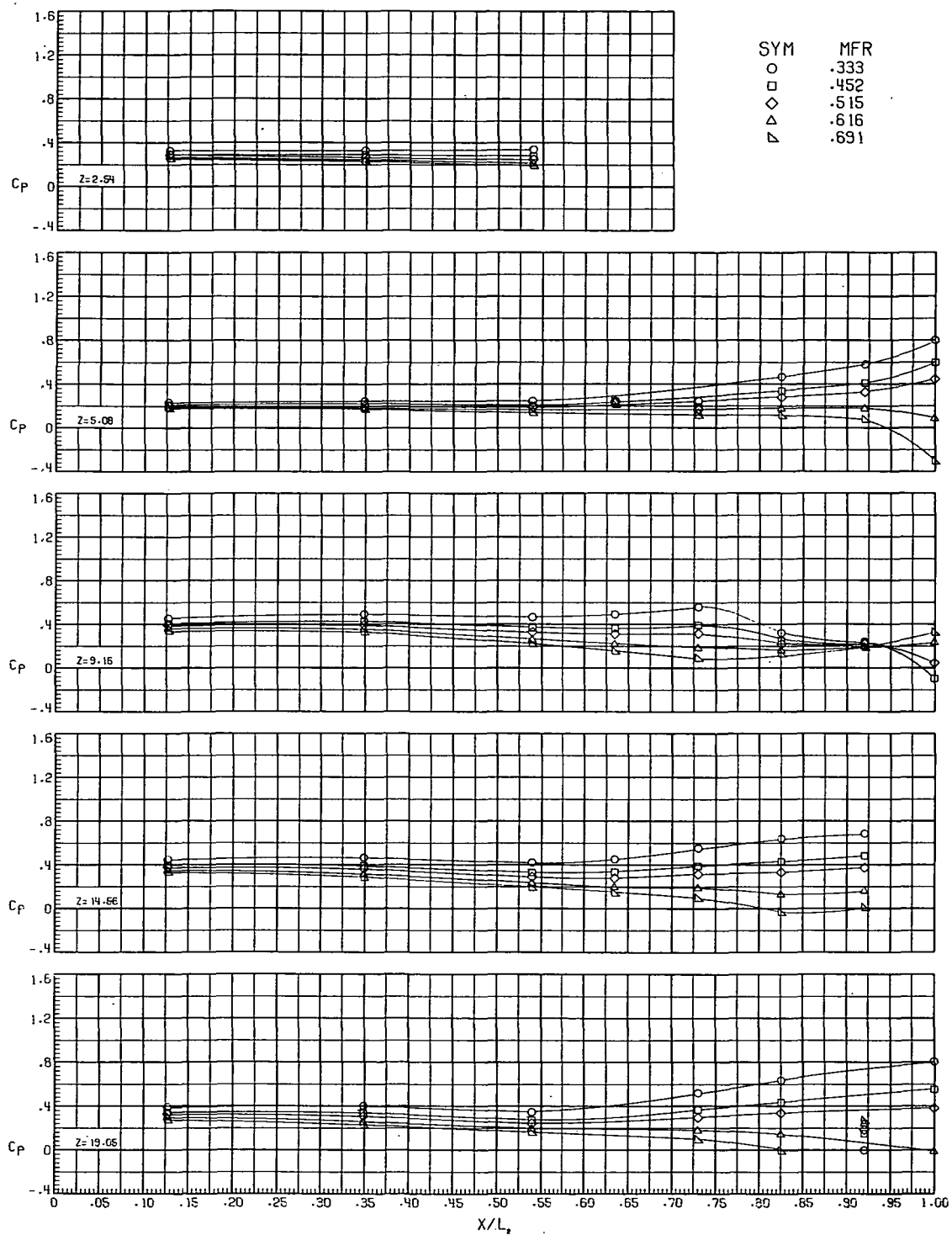
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35. - Continued.



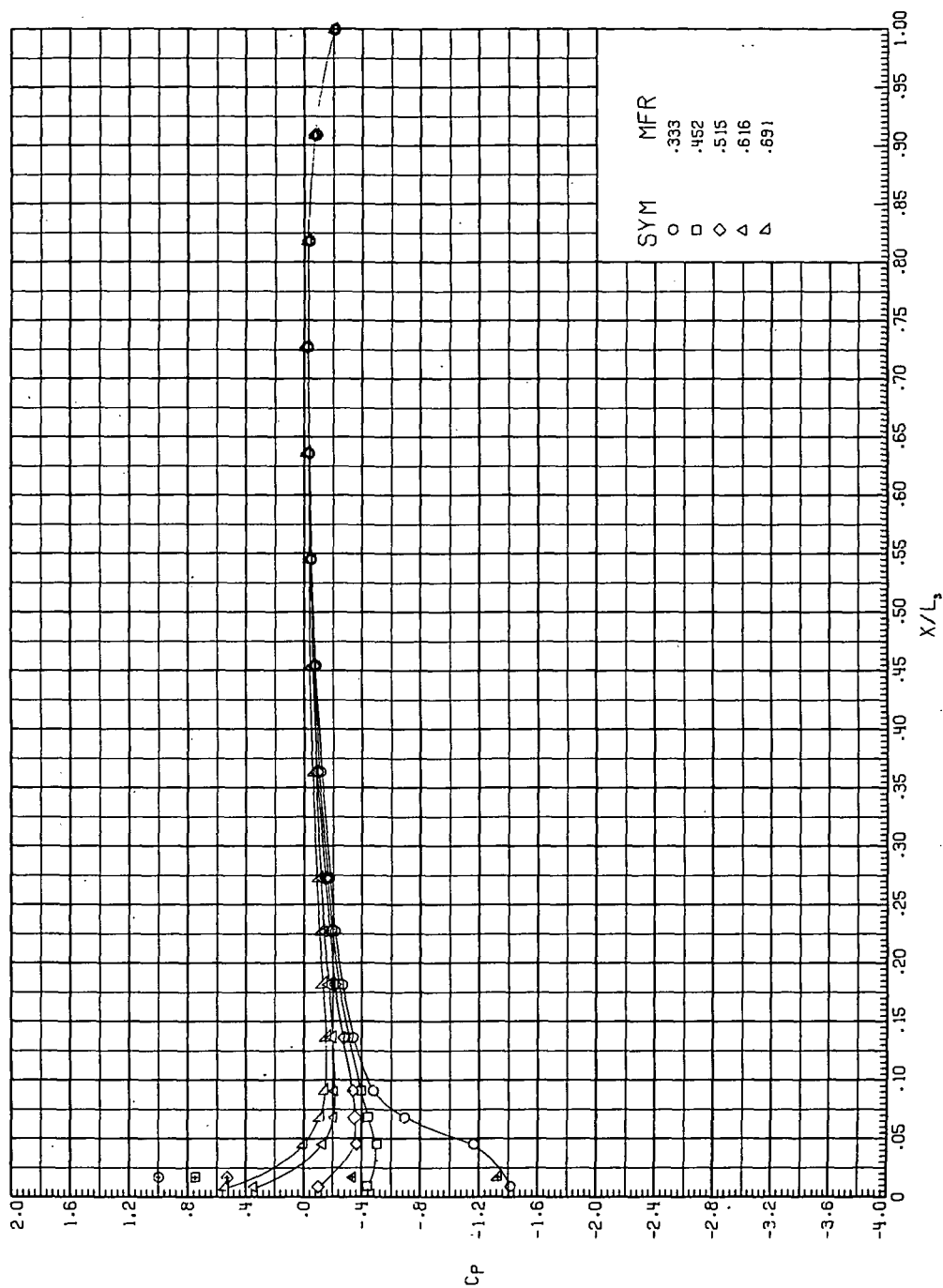
(c) $M = 0.6$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



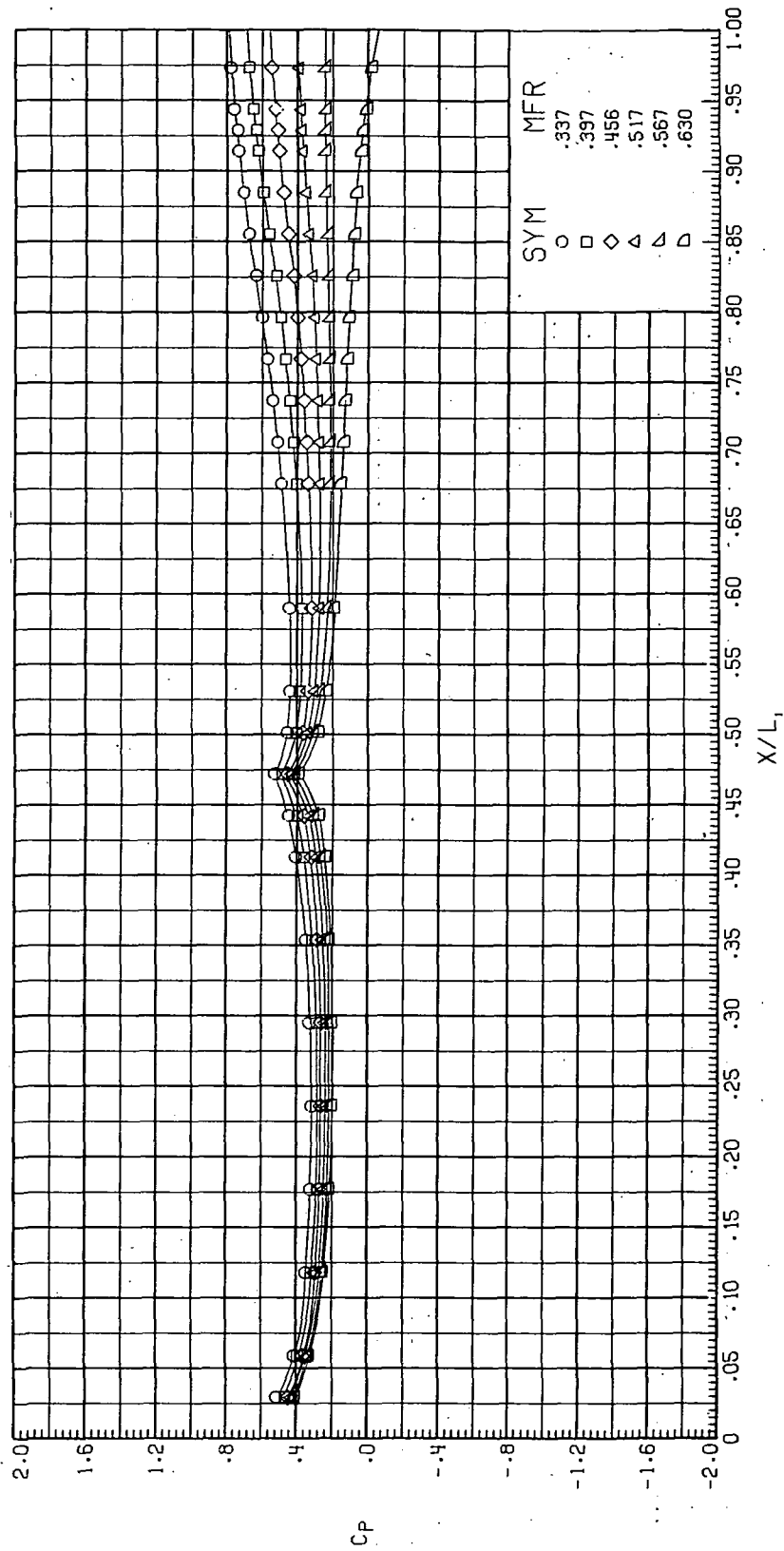
(c) $M = 0.6$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



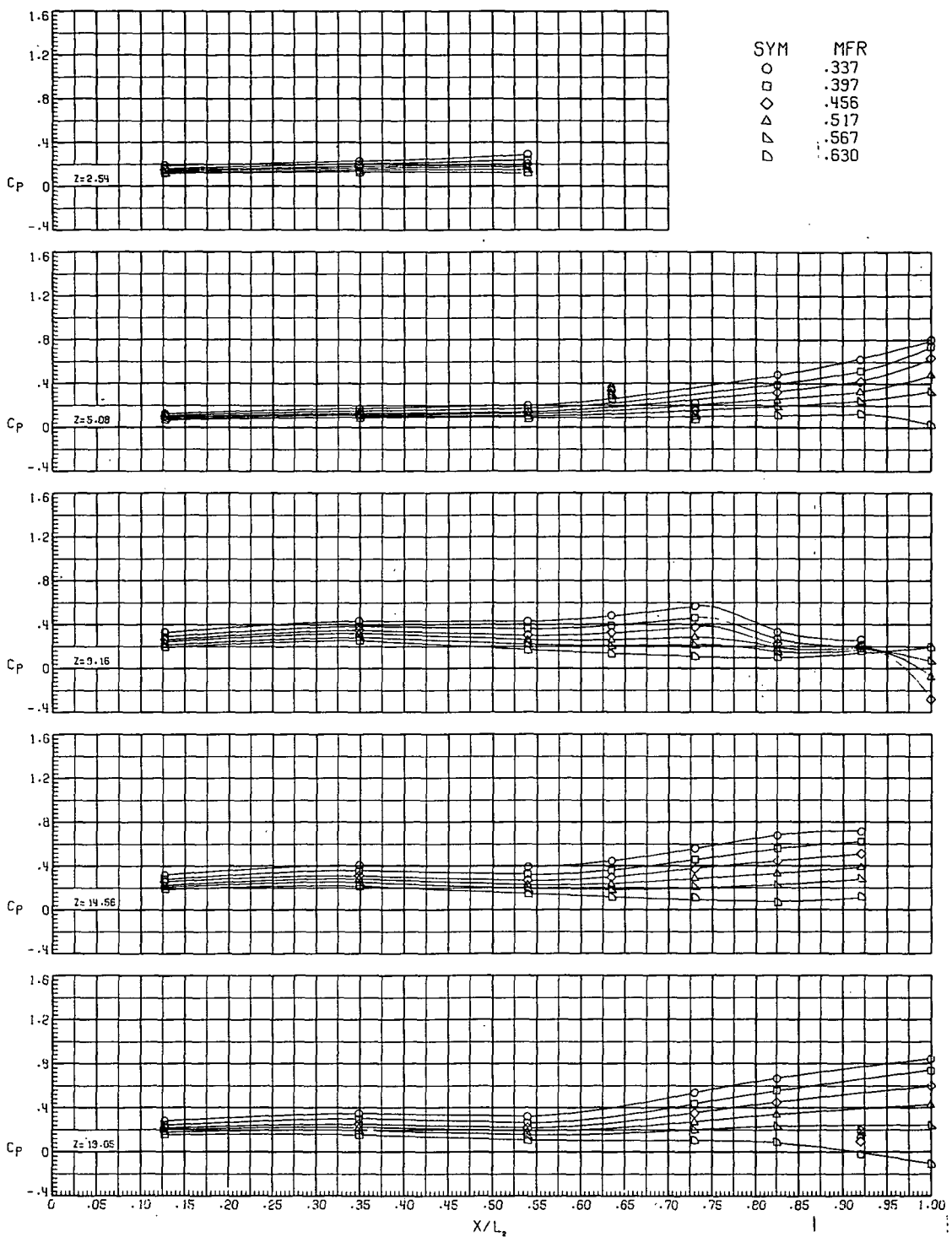
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35.- Continued.



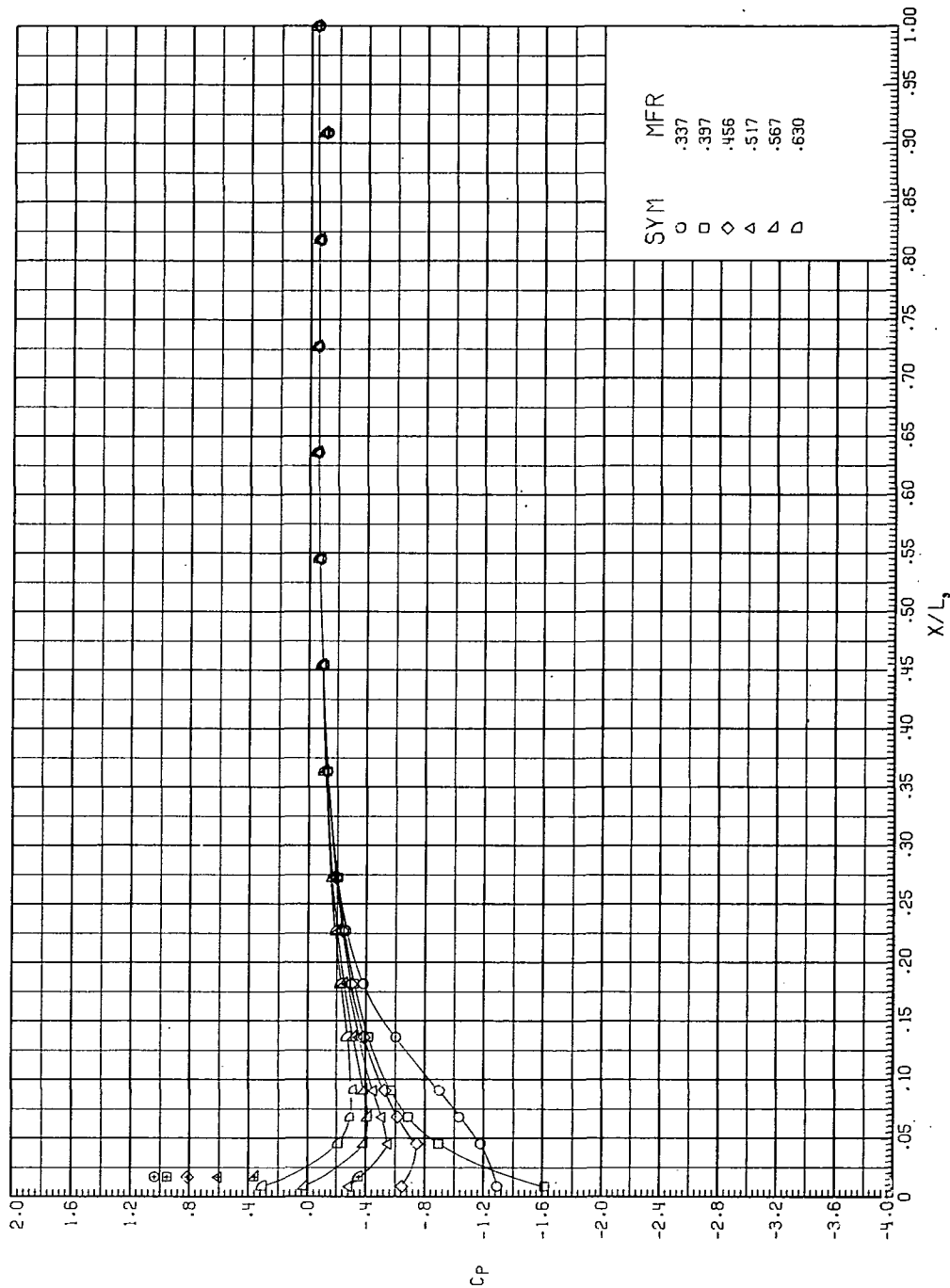
(d) $M = 0.7$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



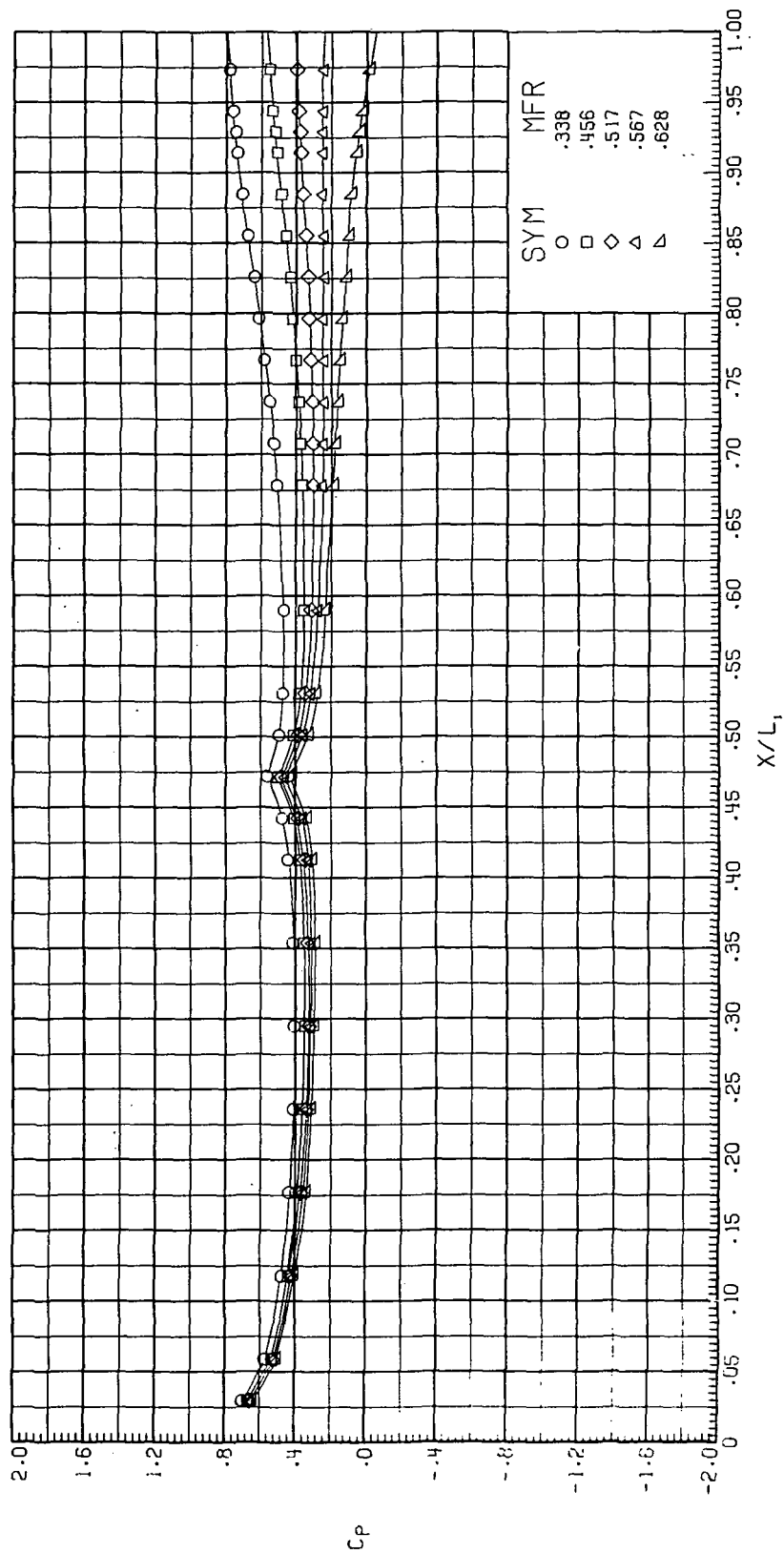
(d) $M = 0.7$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



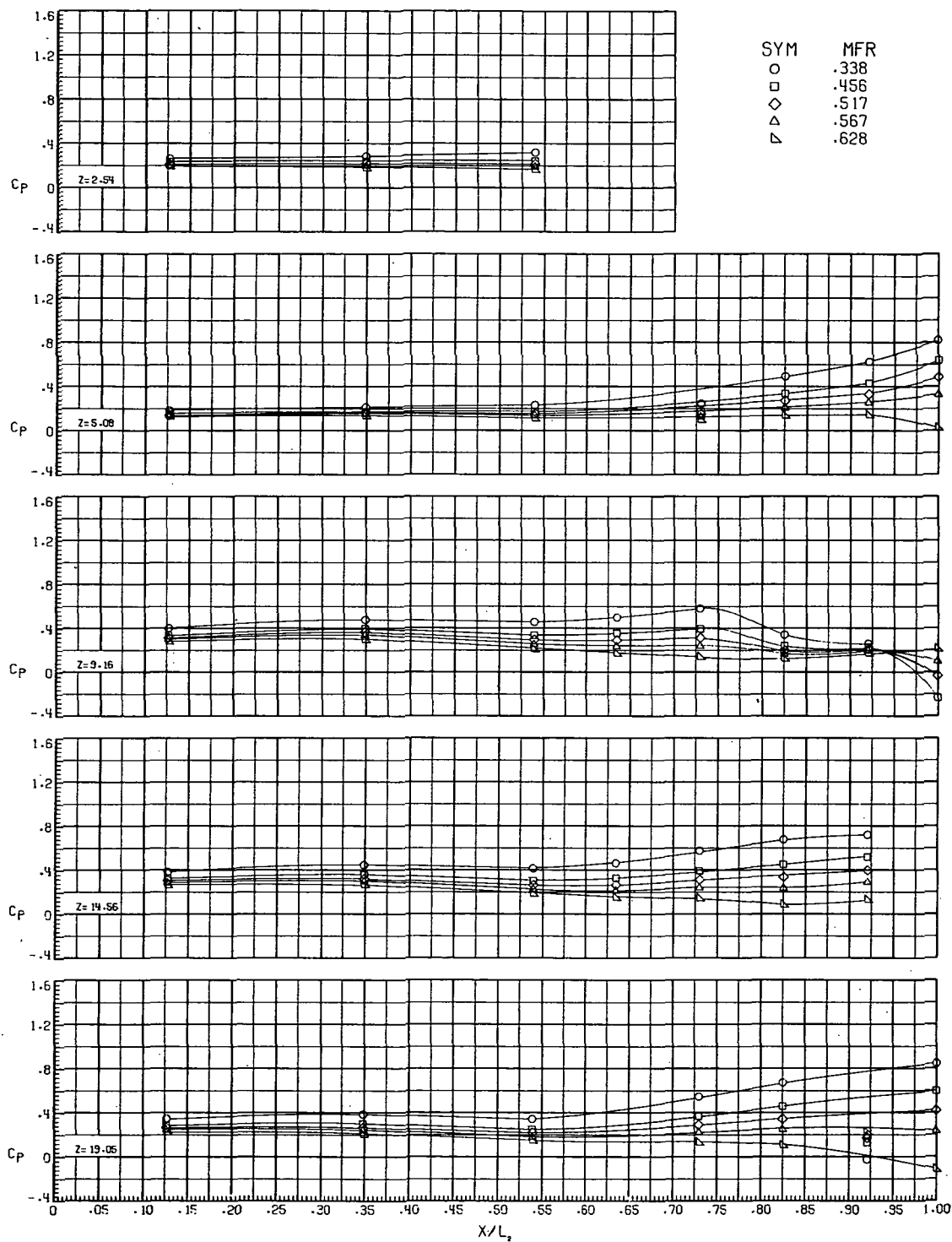
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35.- Continued.



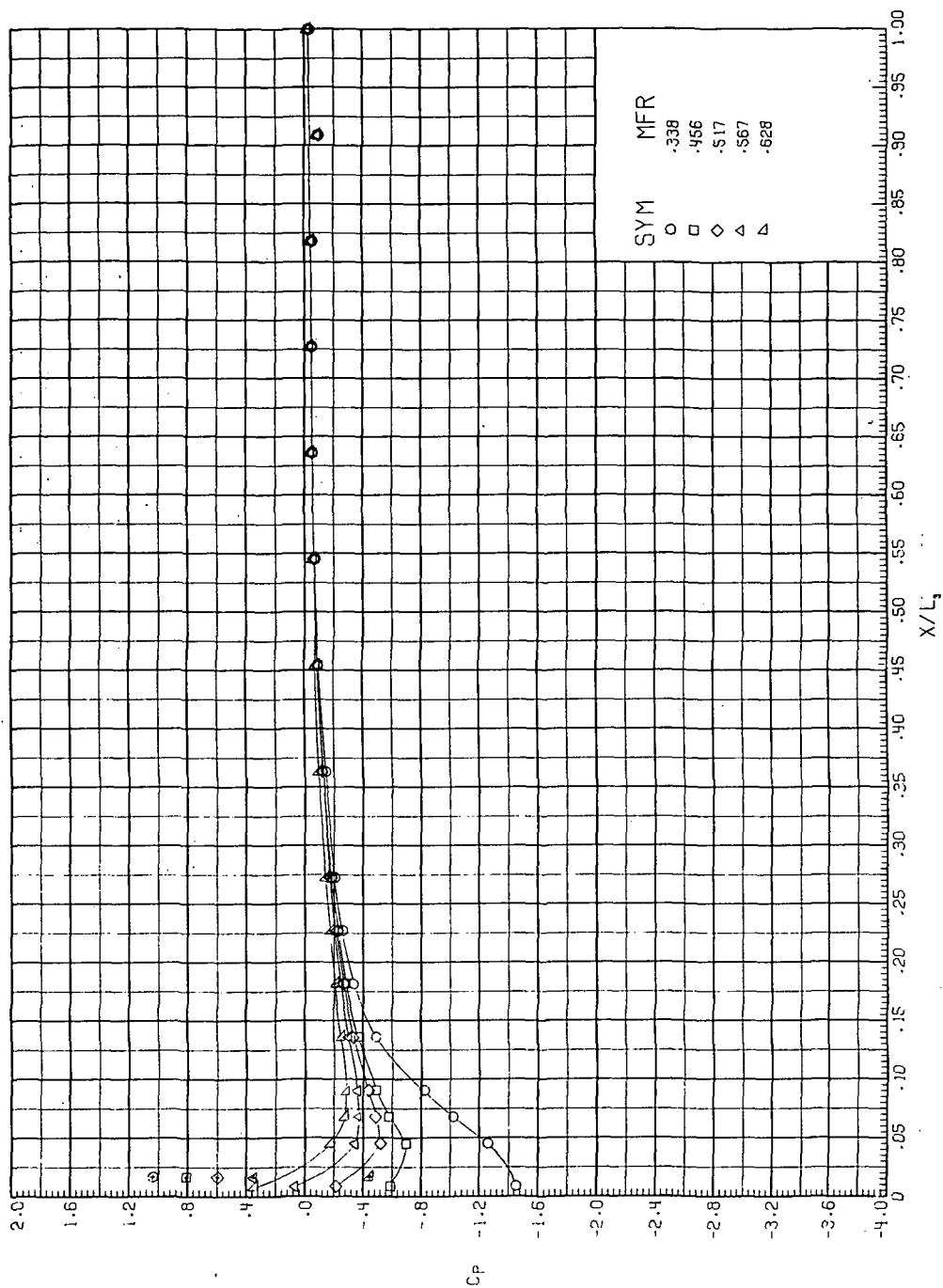
(e) $M = 0.7$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



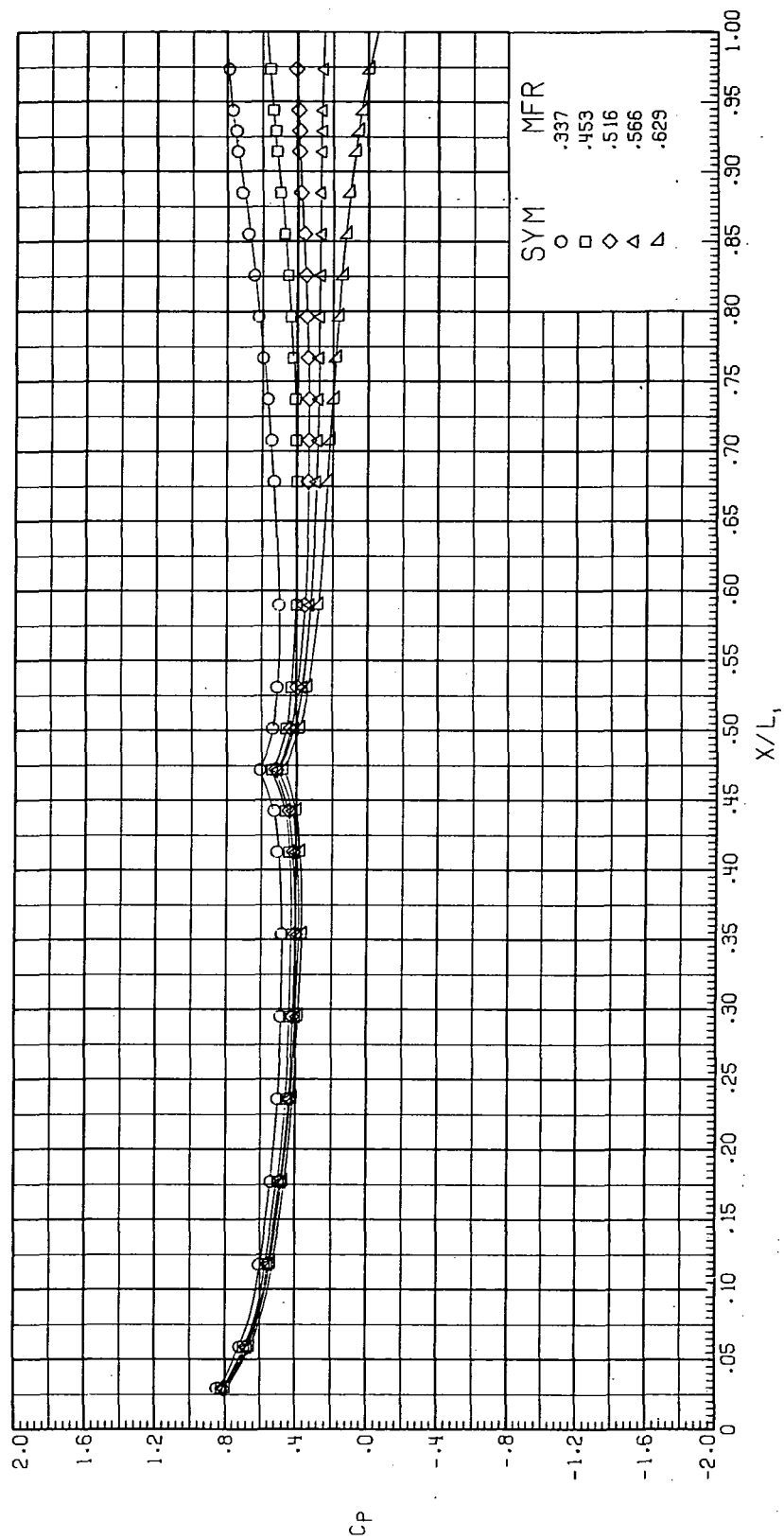
(e) $M = 0.7$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



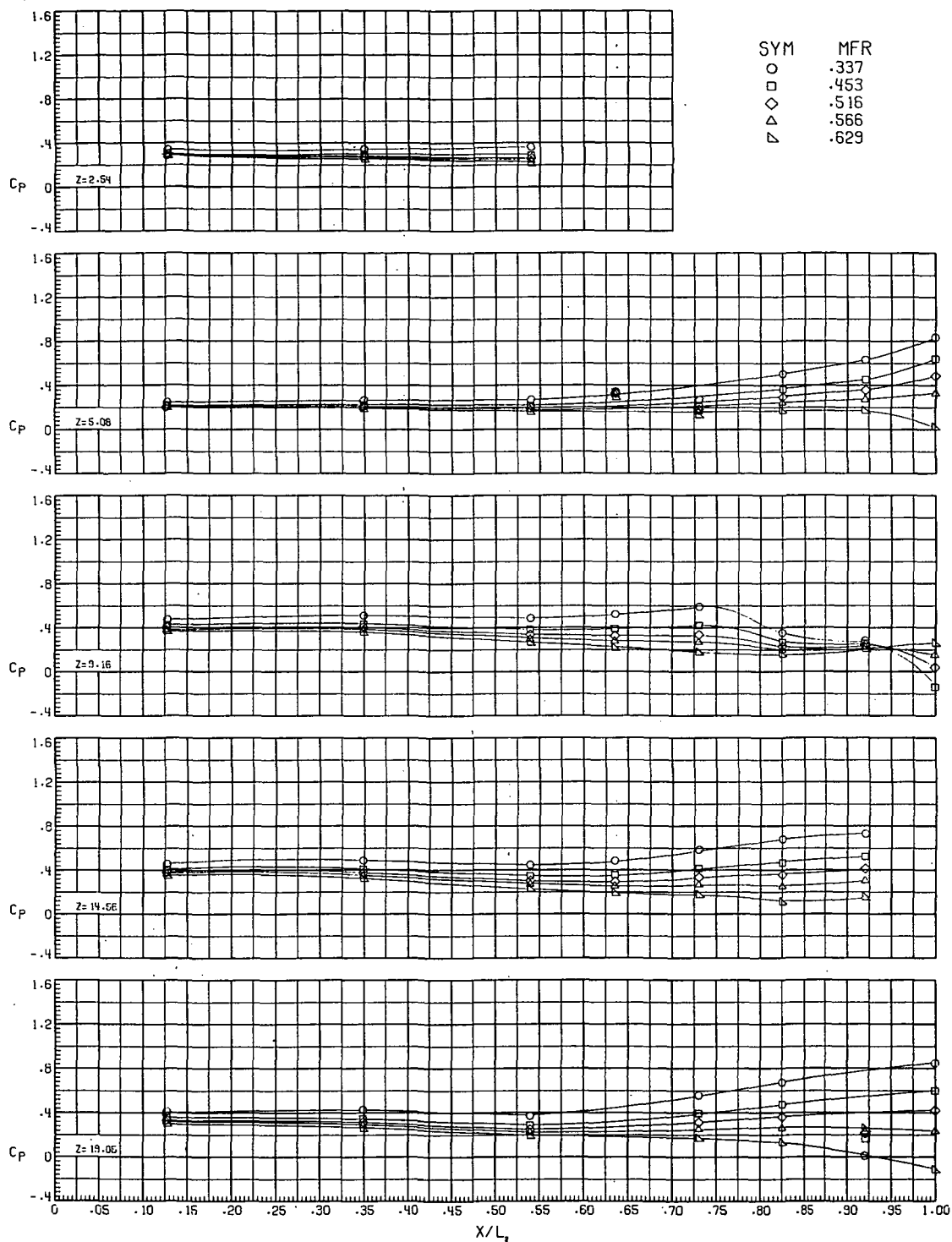
(e) $M = 0.7$; $\alpha = 4^\circ$; cowI longitudinal pressure coefficients. Concluded.

Figure 35.- Continued.



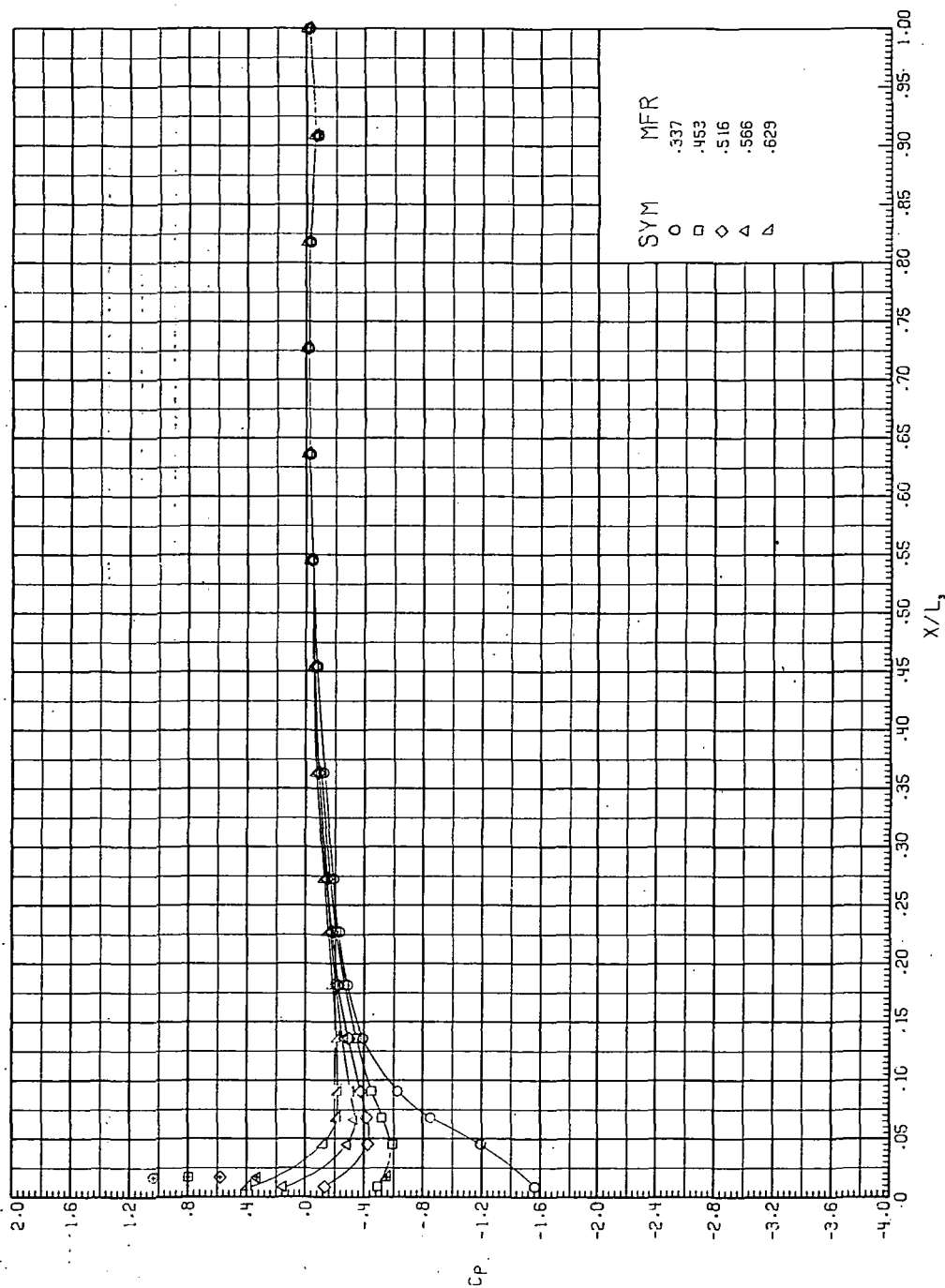
(f) $M = 0.7$; $\alpha = 80^\circ$; ramp-pressure coefficients.

Figure 35. - Continued.



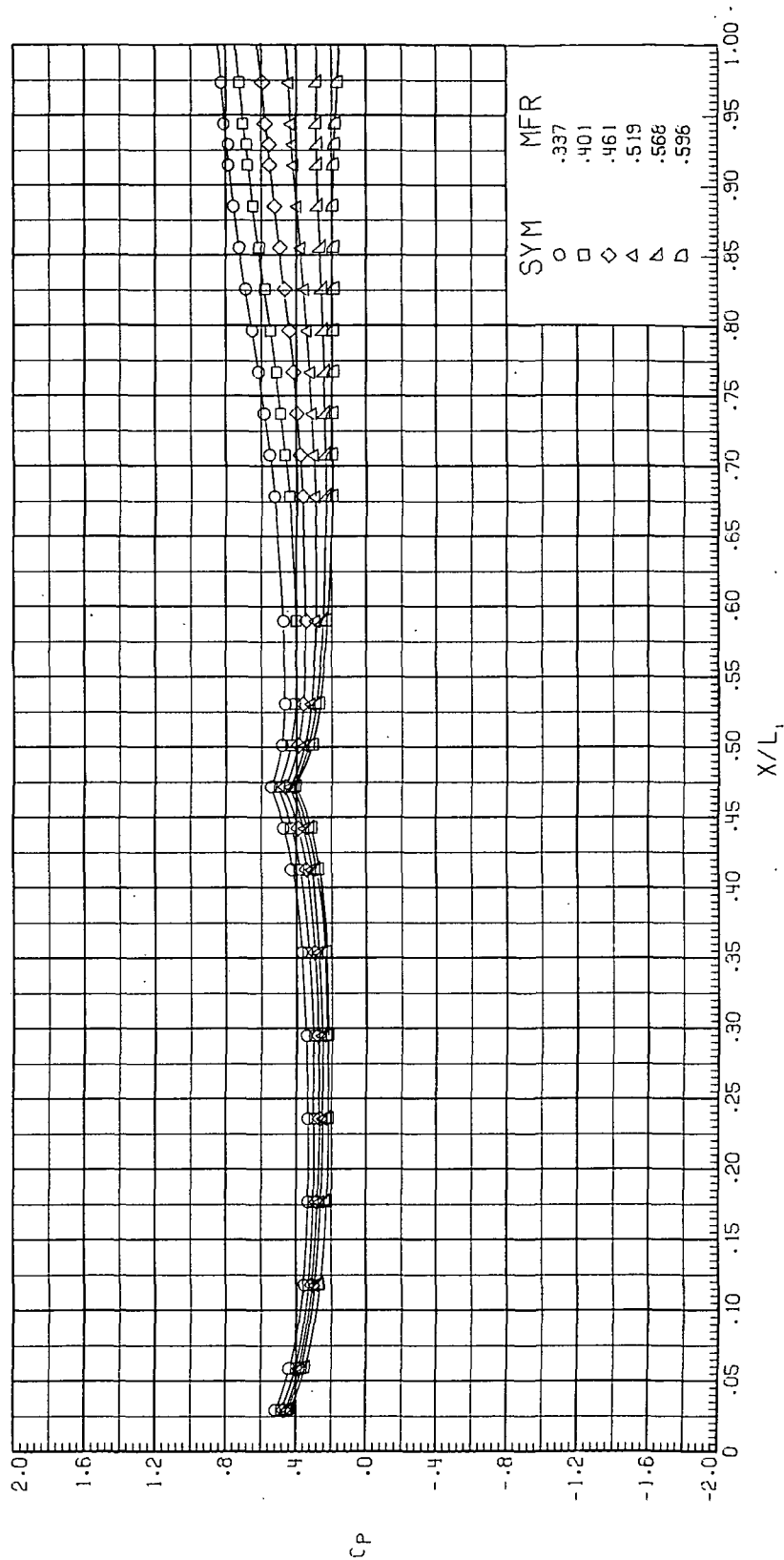
(f) $M = 0.7$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



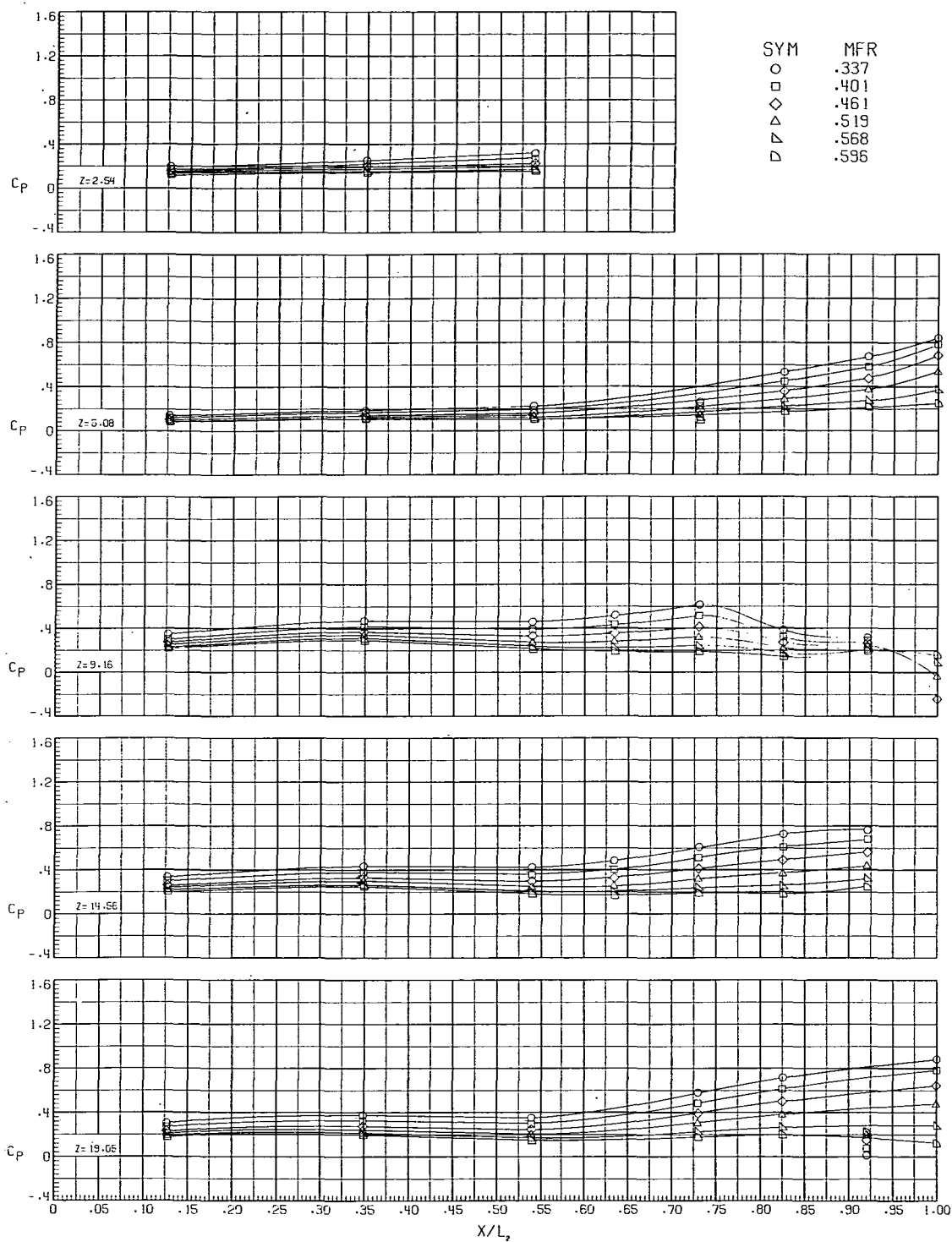
(f) $M = 0.7$; $\alpha = 80^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35. - Continued.



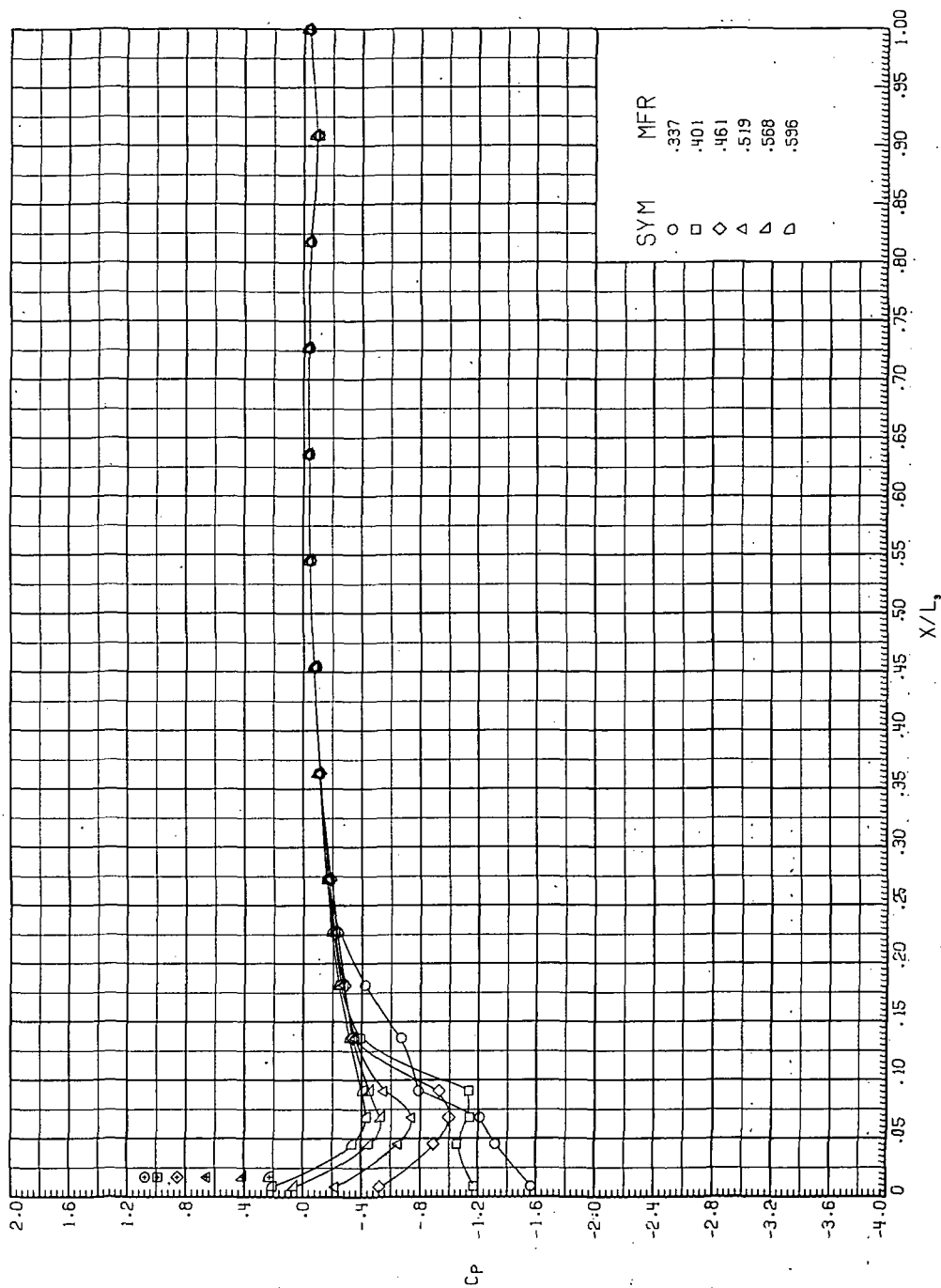
(g) $M = 0.8$; $\alpha = 0^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



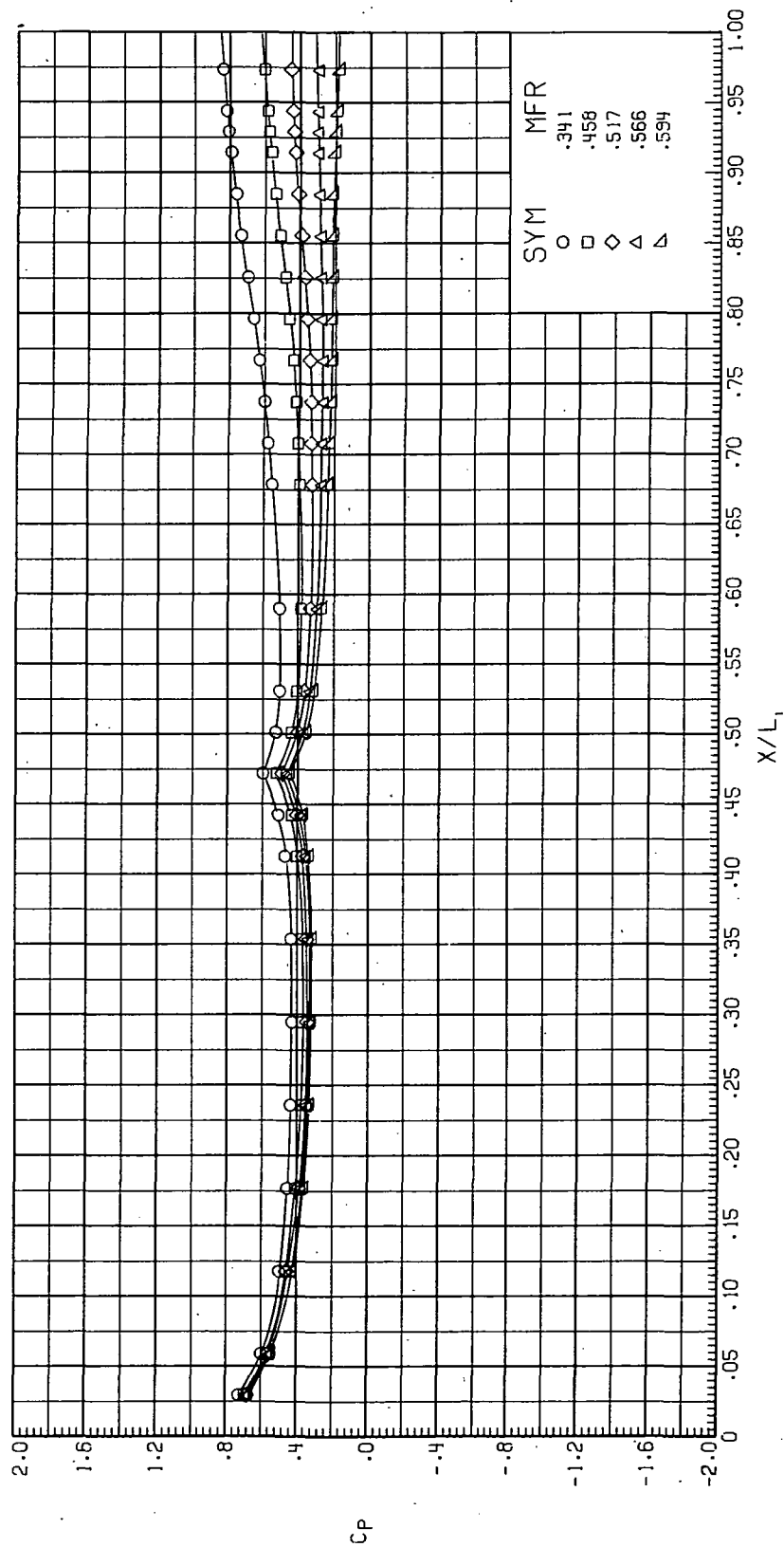
(g) $M = 0.8$; $\alpha = 0^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



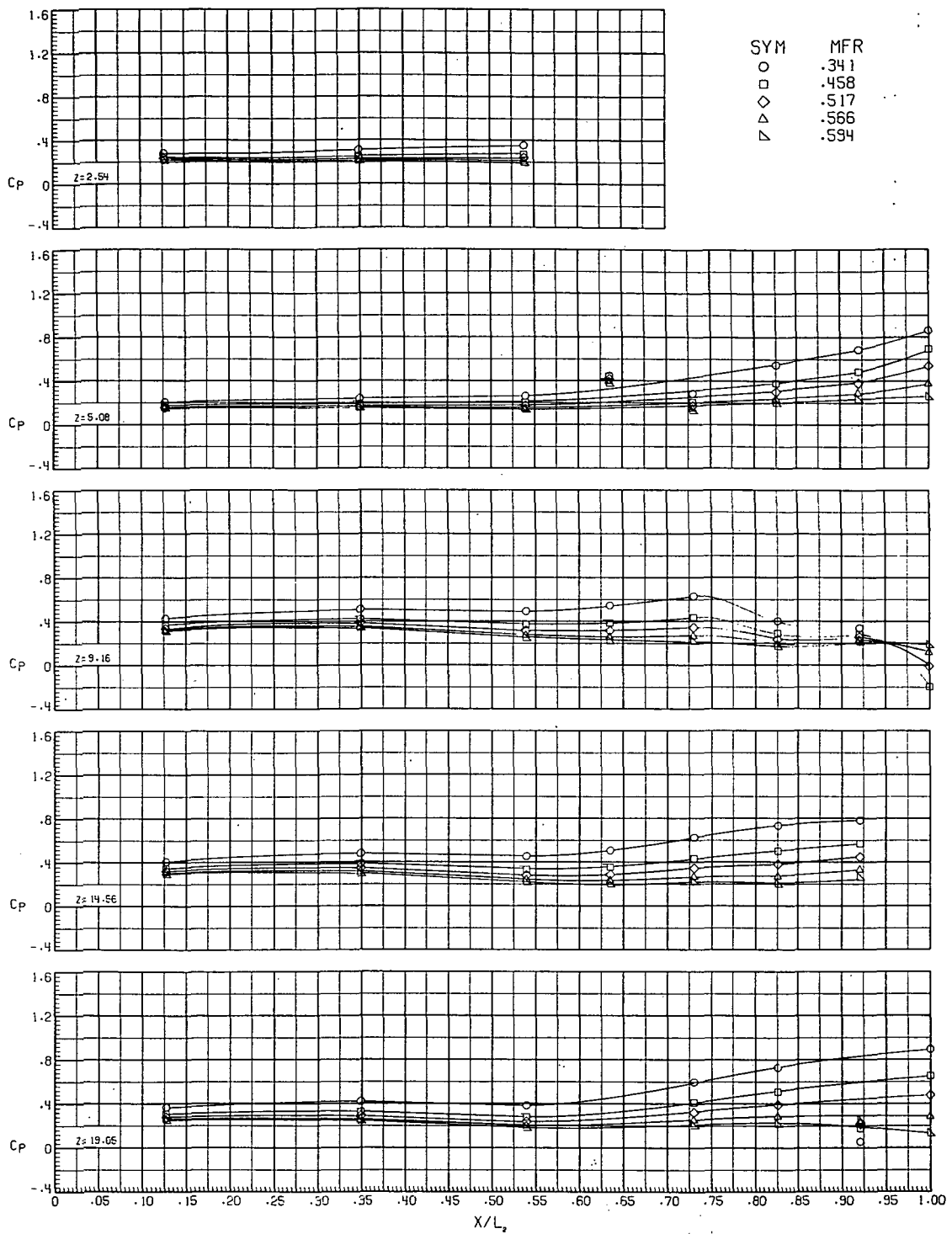
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35. - Continued.



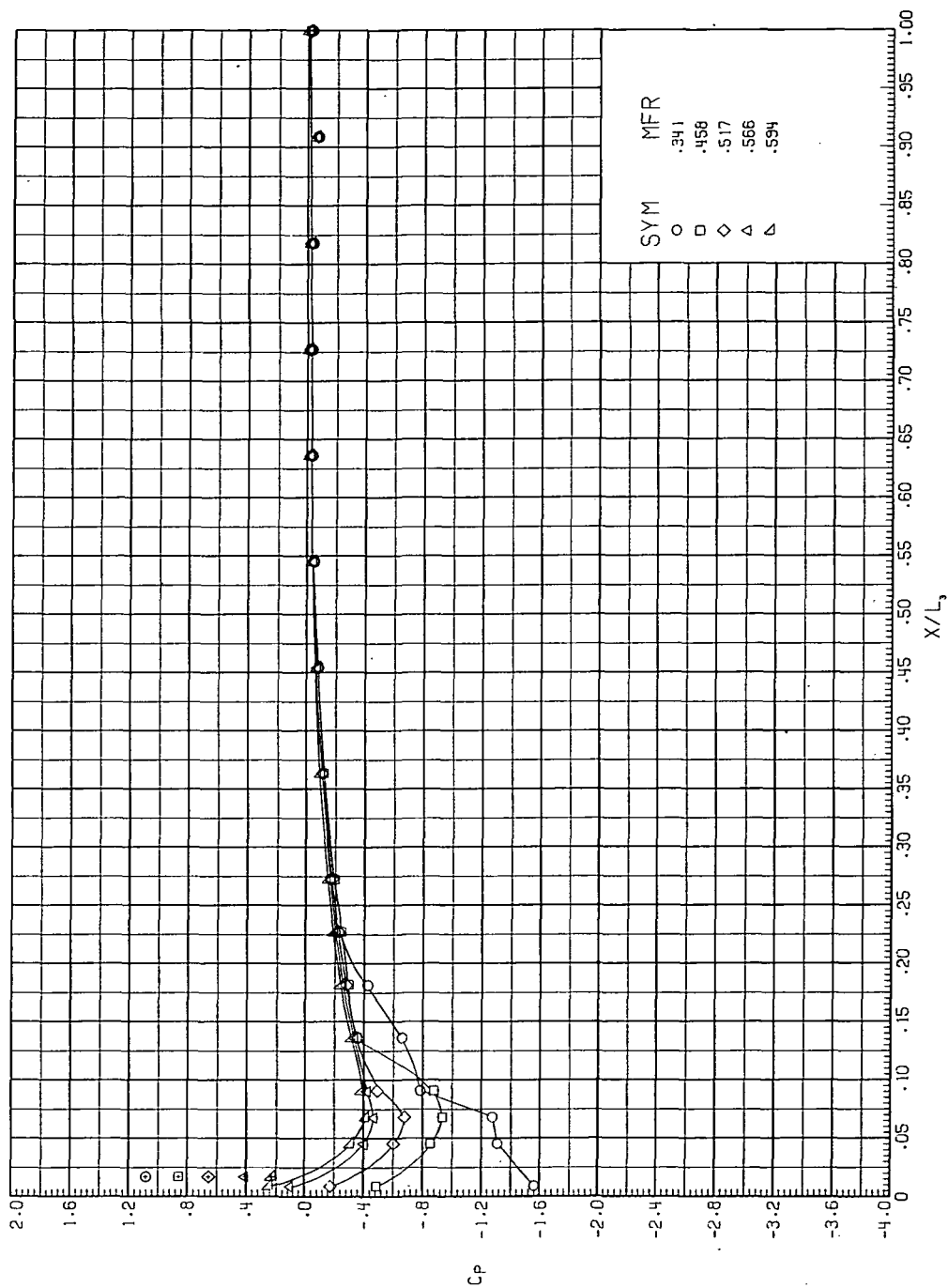
(h) $M = 0.8$; $\alpha = 4^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



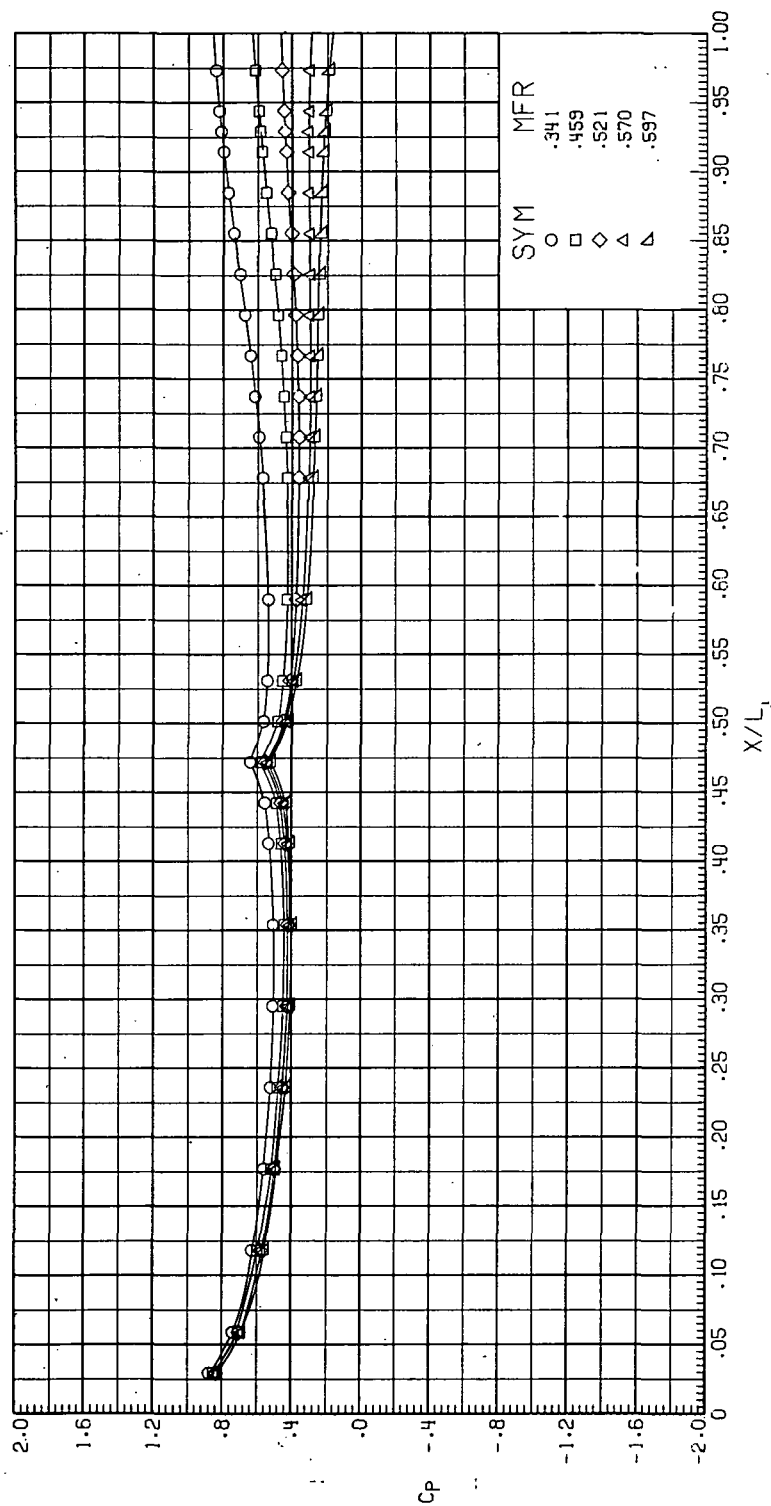
(h) $M = 0.8$; $\alpha = 4^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



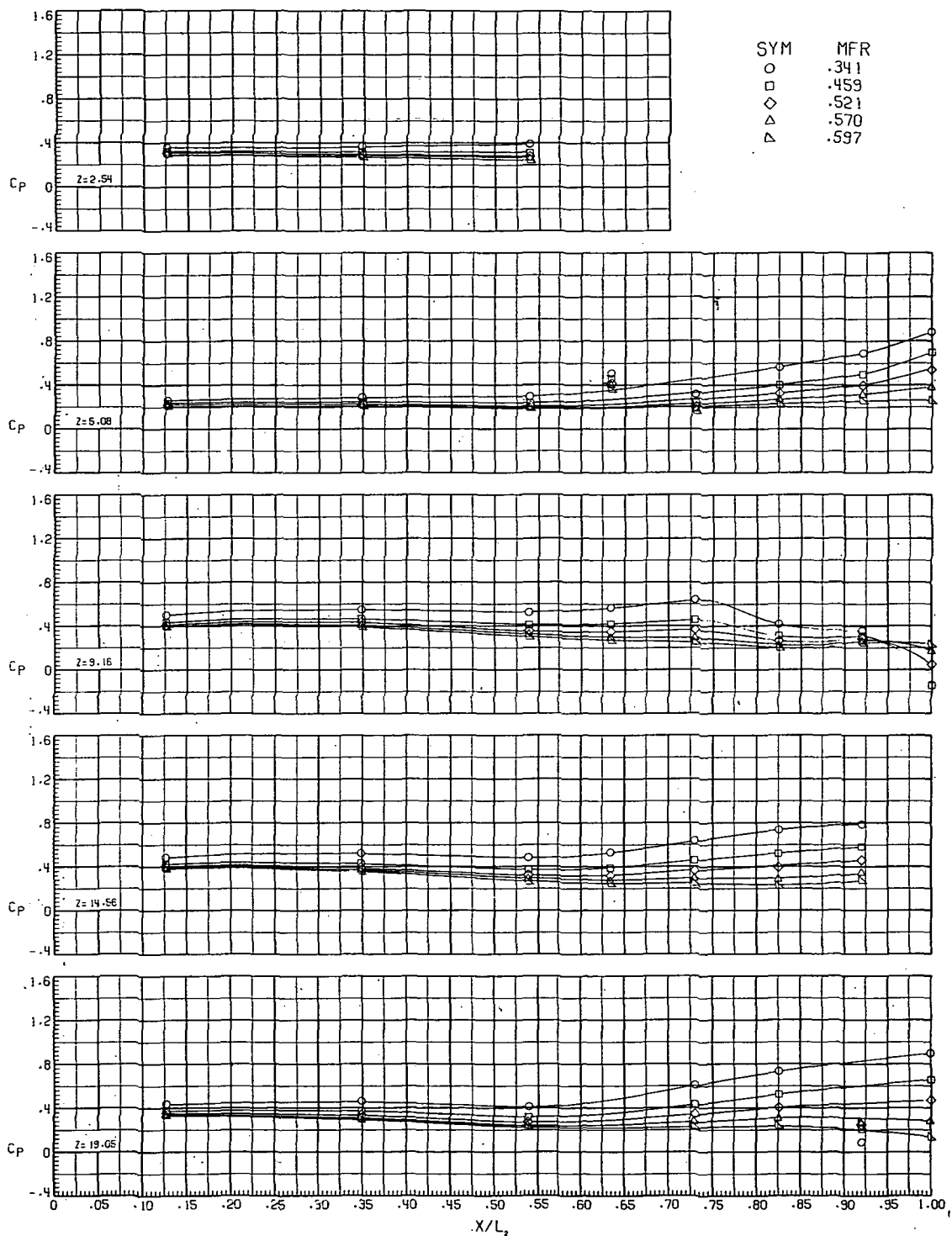
(h) $M = 0.8$; $\alpha = 40^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35.- Continued.



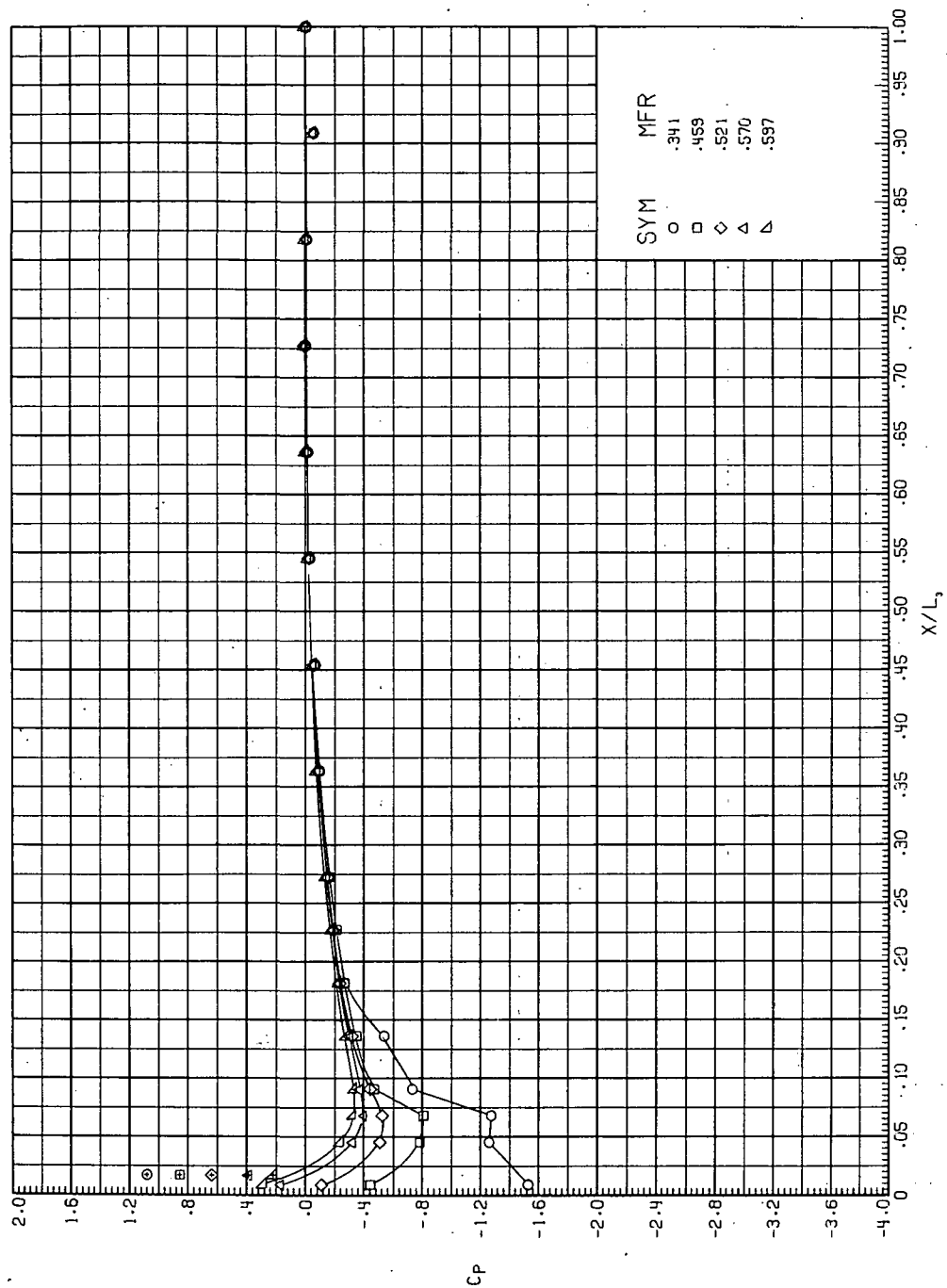
(i) $M = 0.8$; $\alpha = 8^\circ$; ramp pressure coefficients.

Figure 35.- Continued.



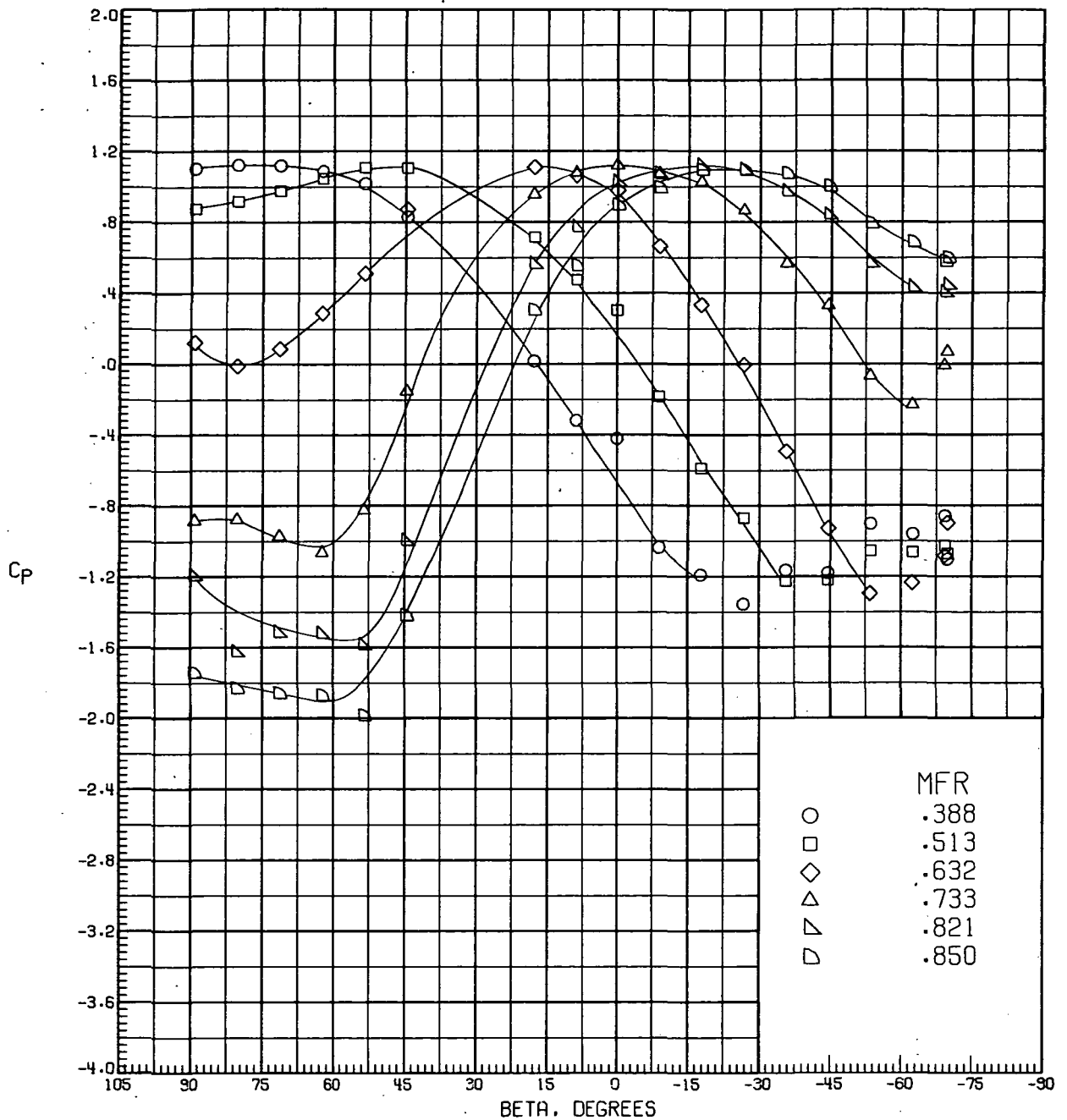
(i) $M = 0.8$; $\alpha = 8^\circ$; sideplate pressure coefficients. Continued.

Figure 35.- Continued.



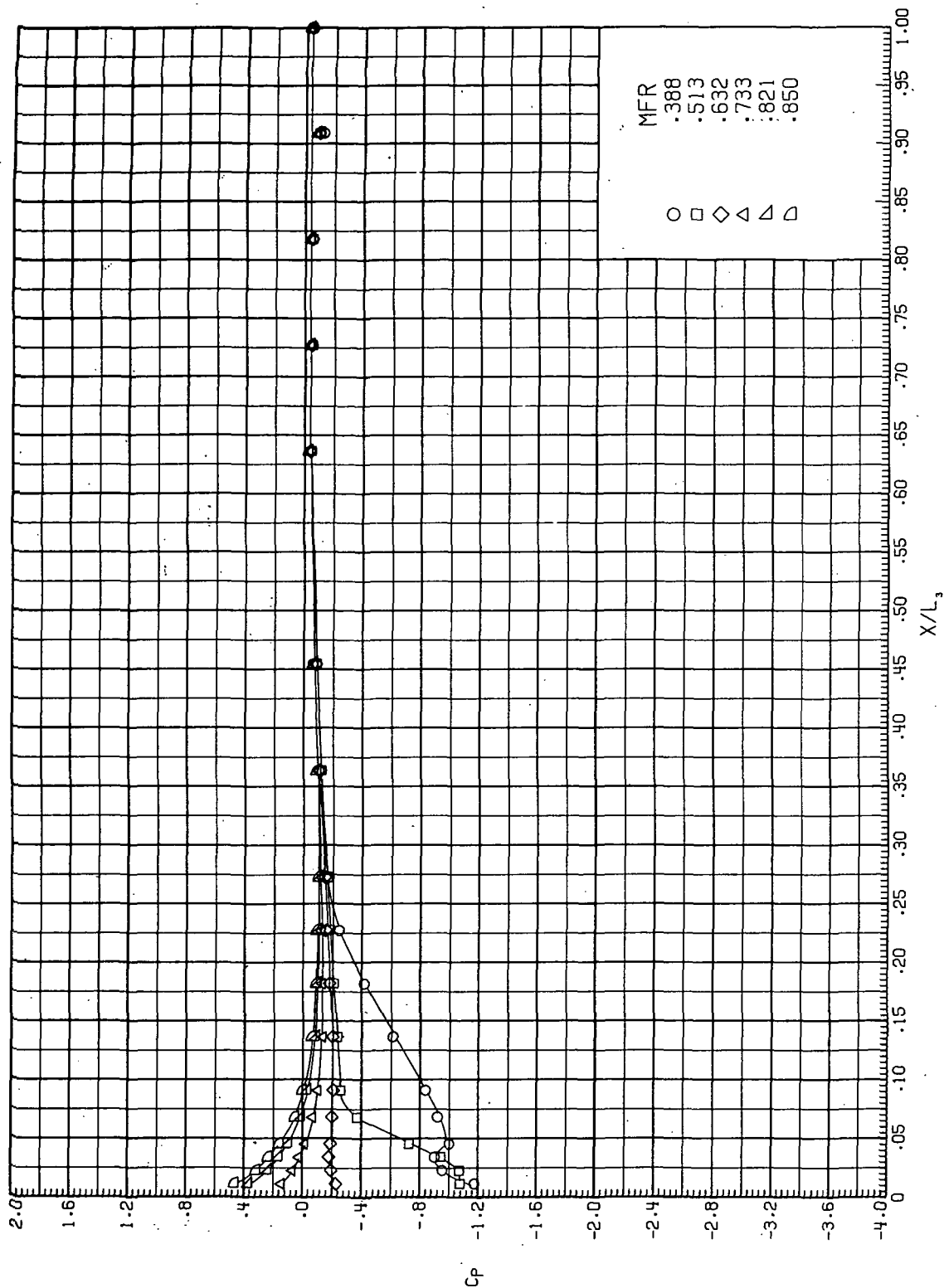
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 35.- Concluded.



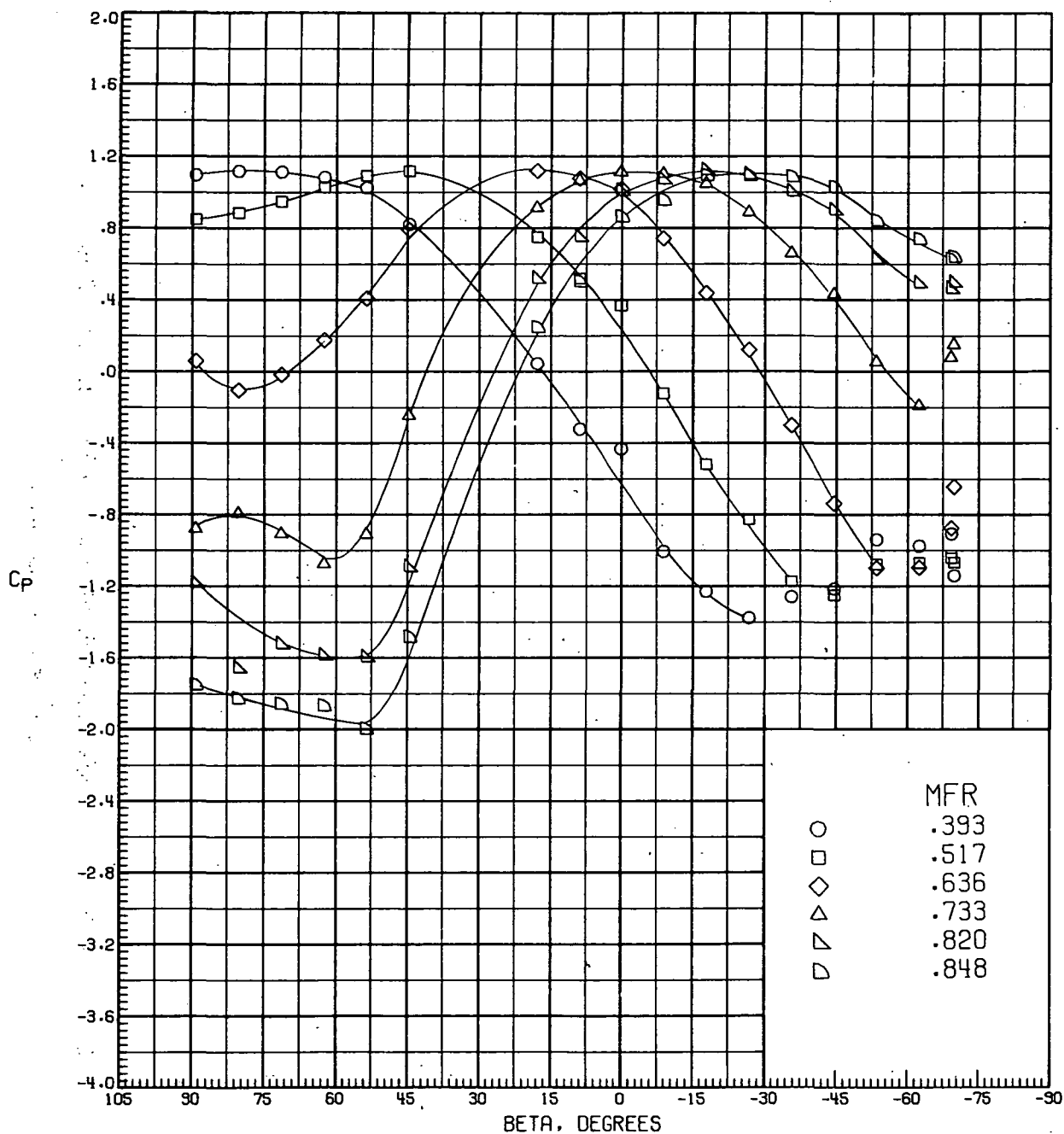
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 36.- Pressure coefficients for cowl 20-2. $\delta_1 = \delta_2 = 5^\circ$.



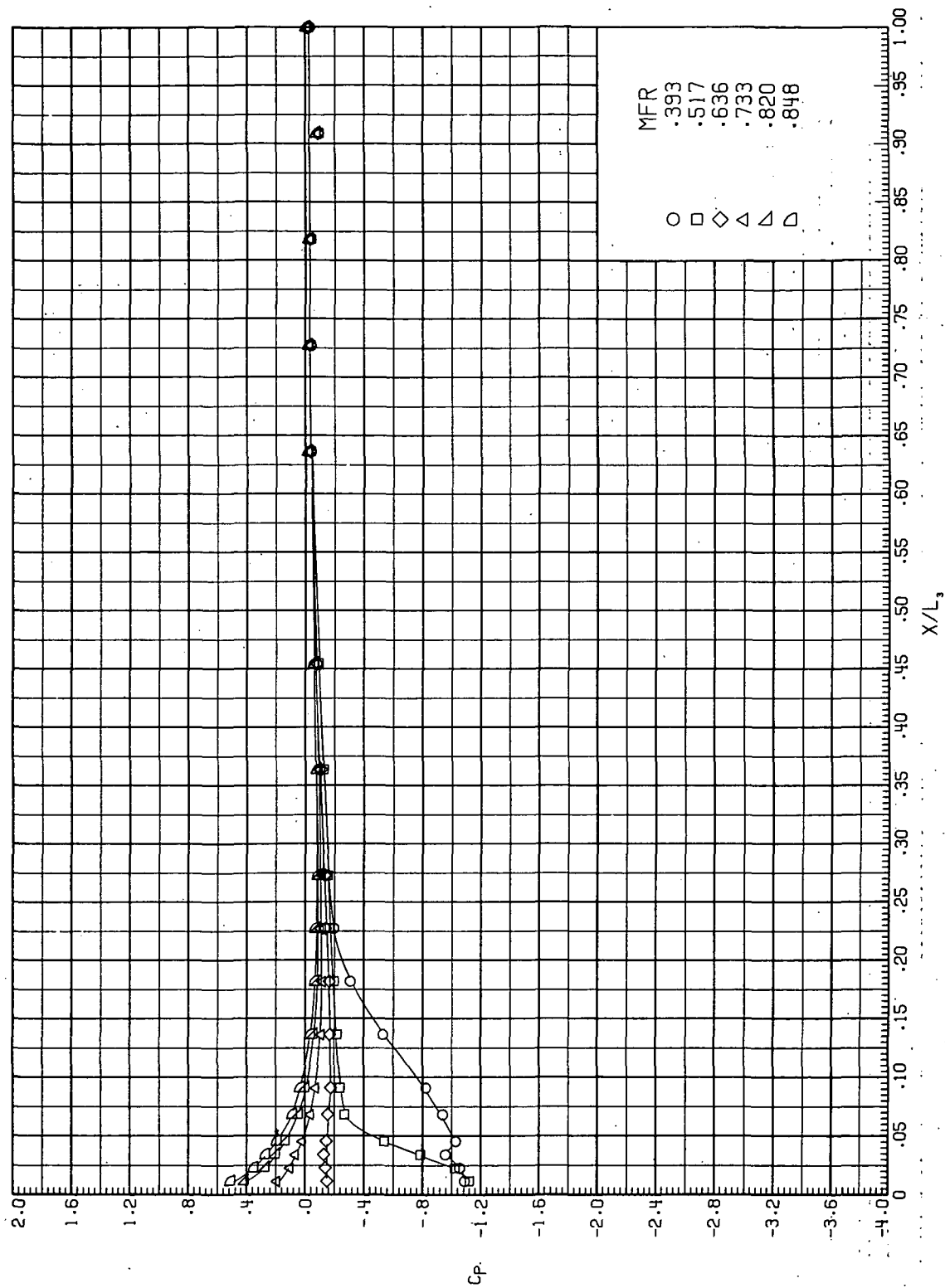
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



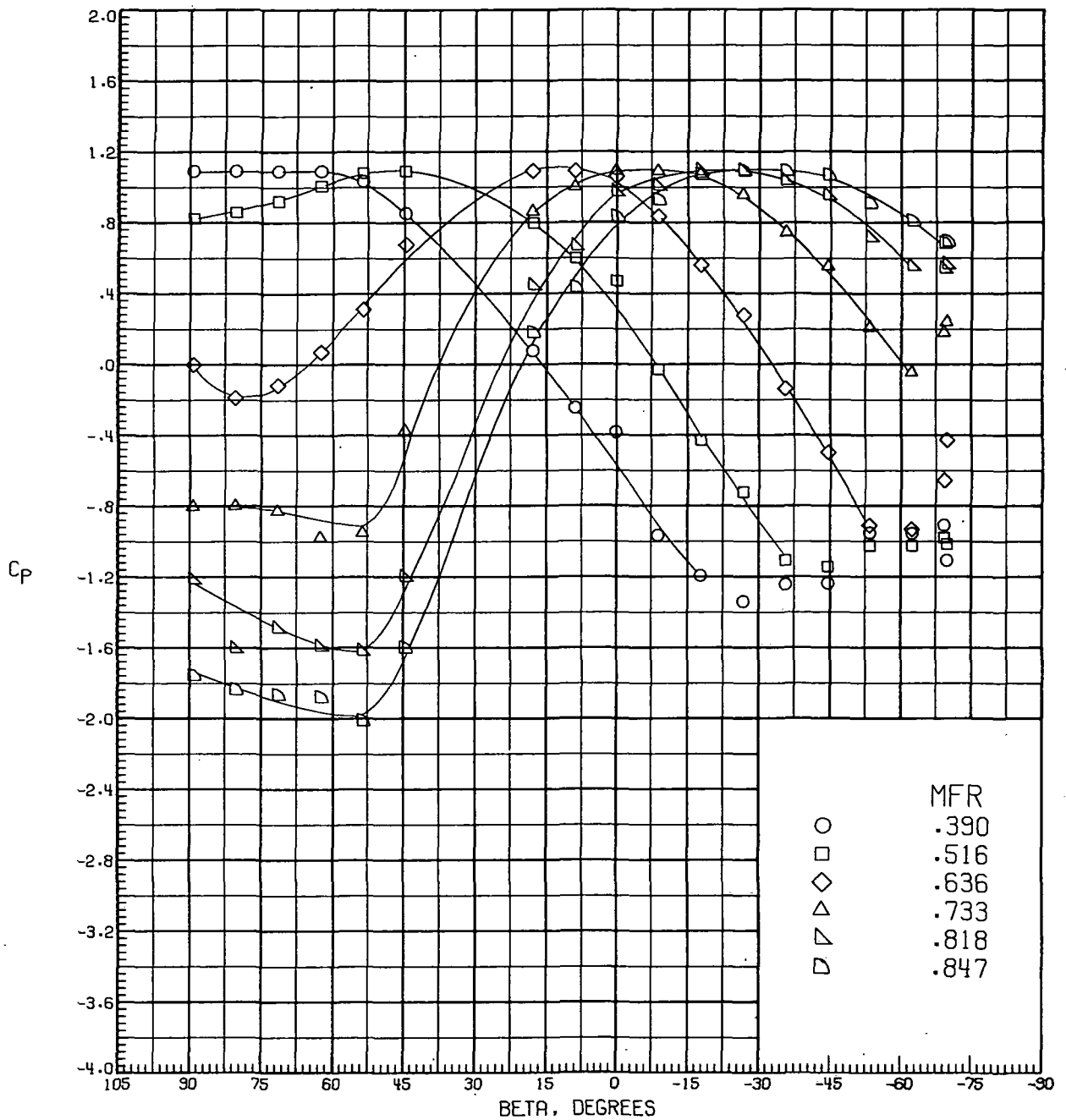
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



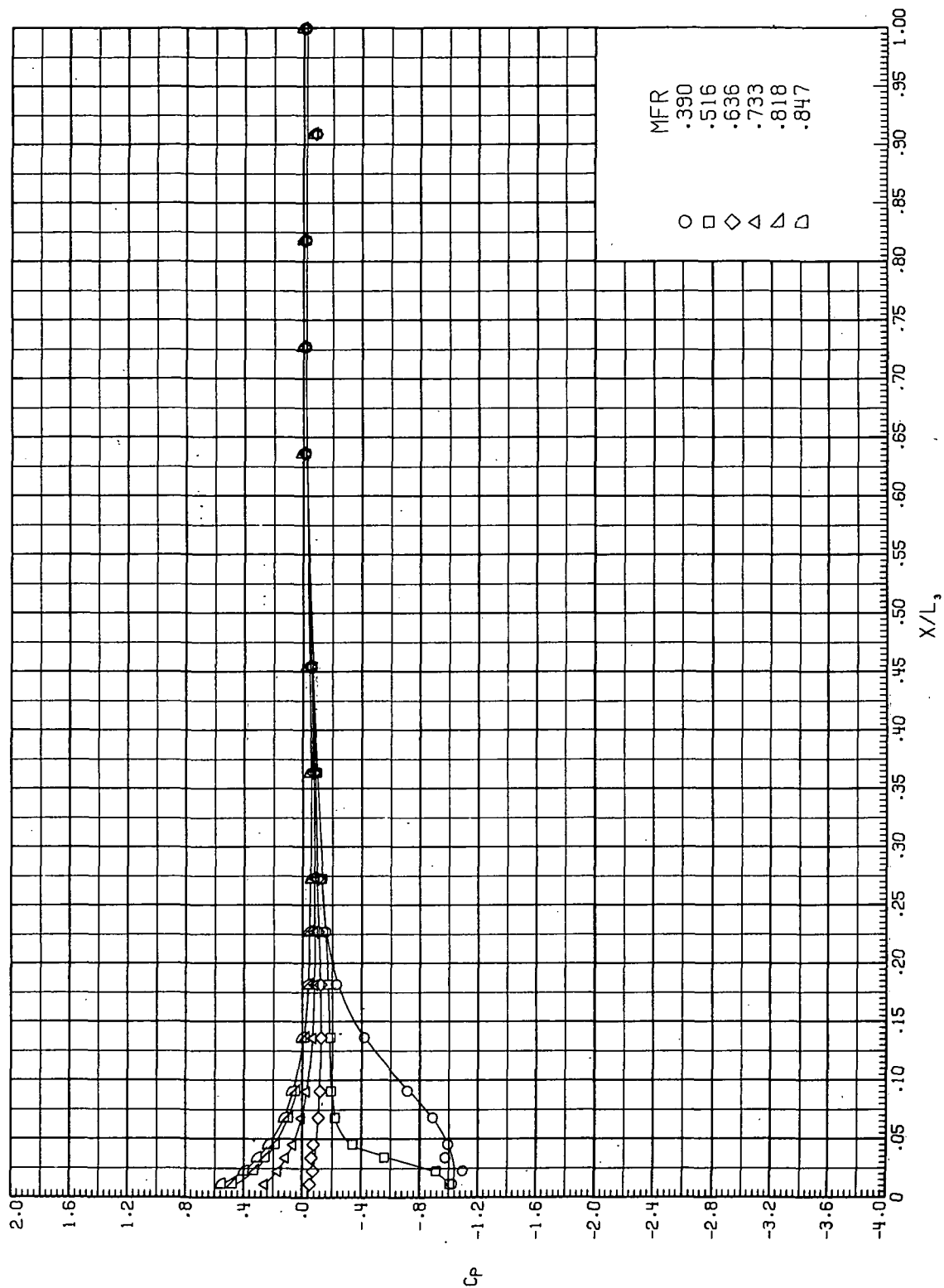
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



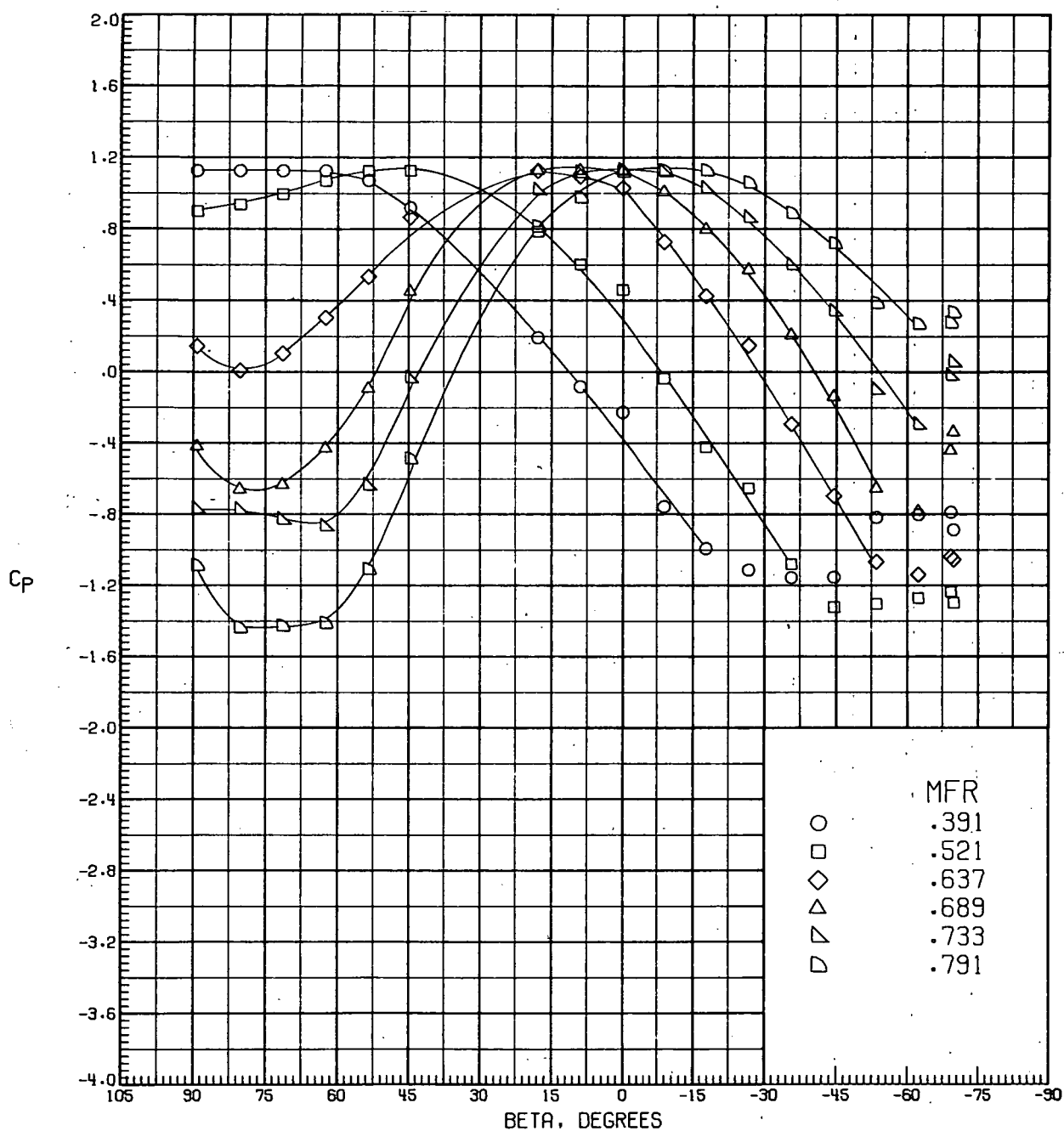
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



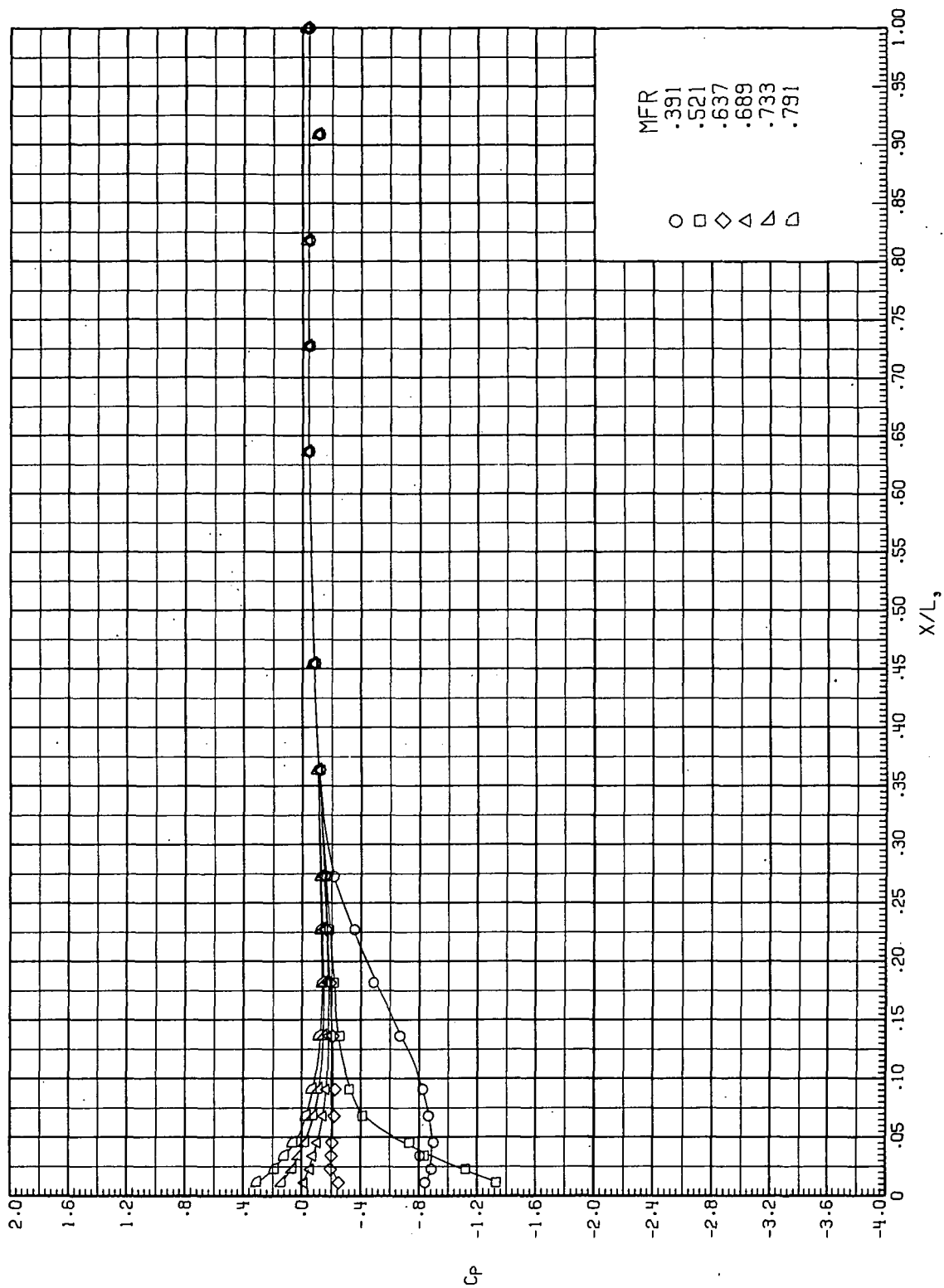
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



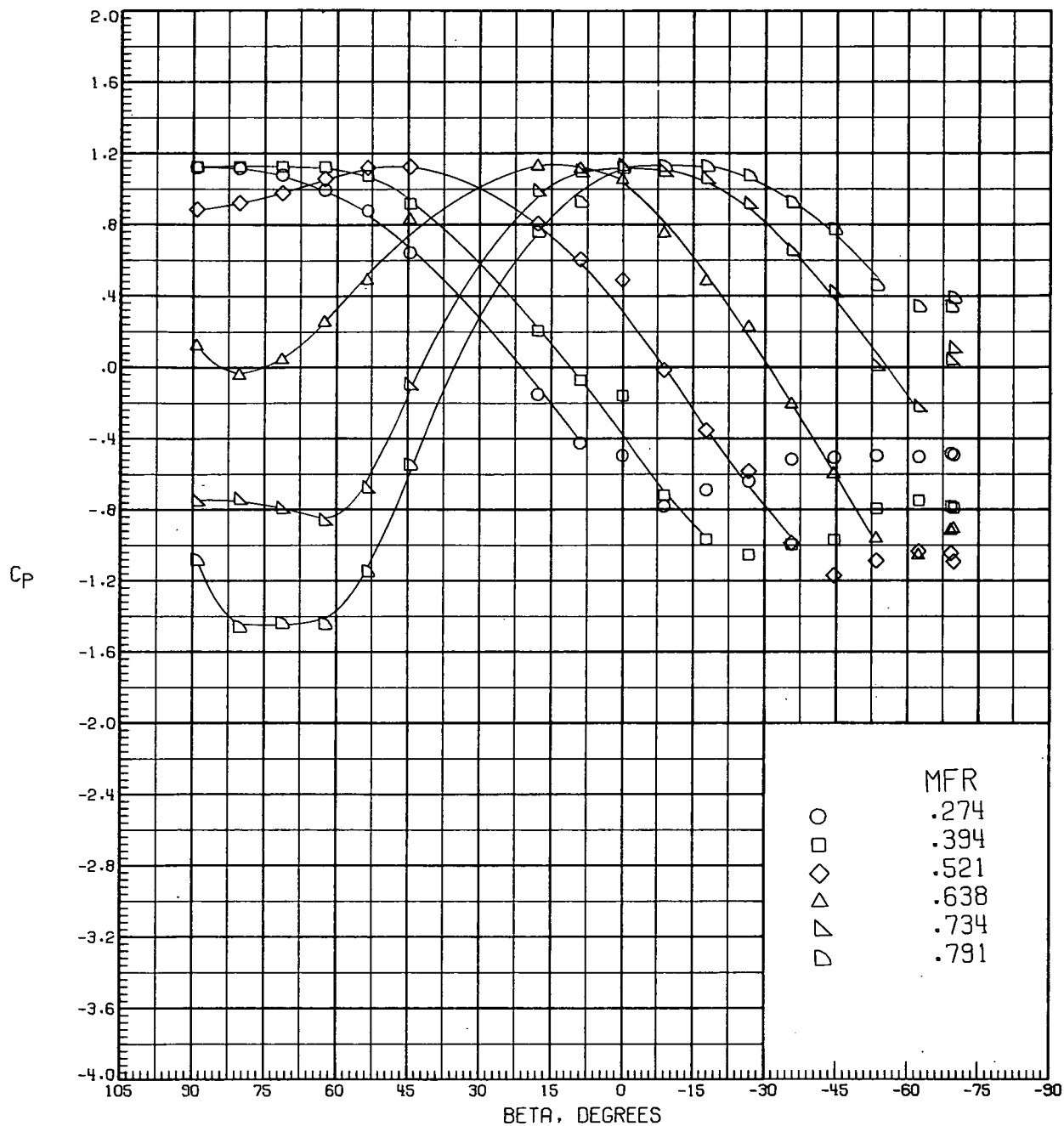
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



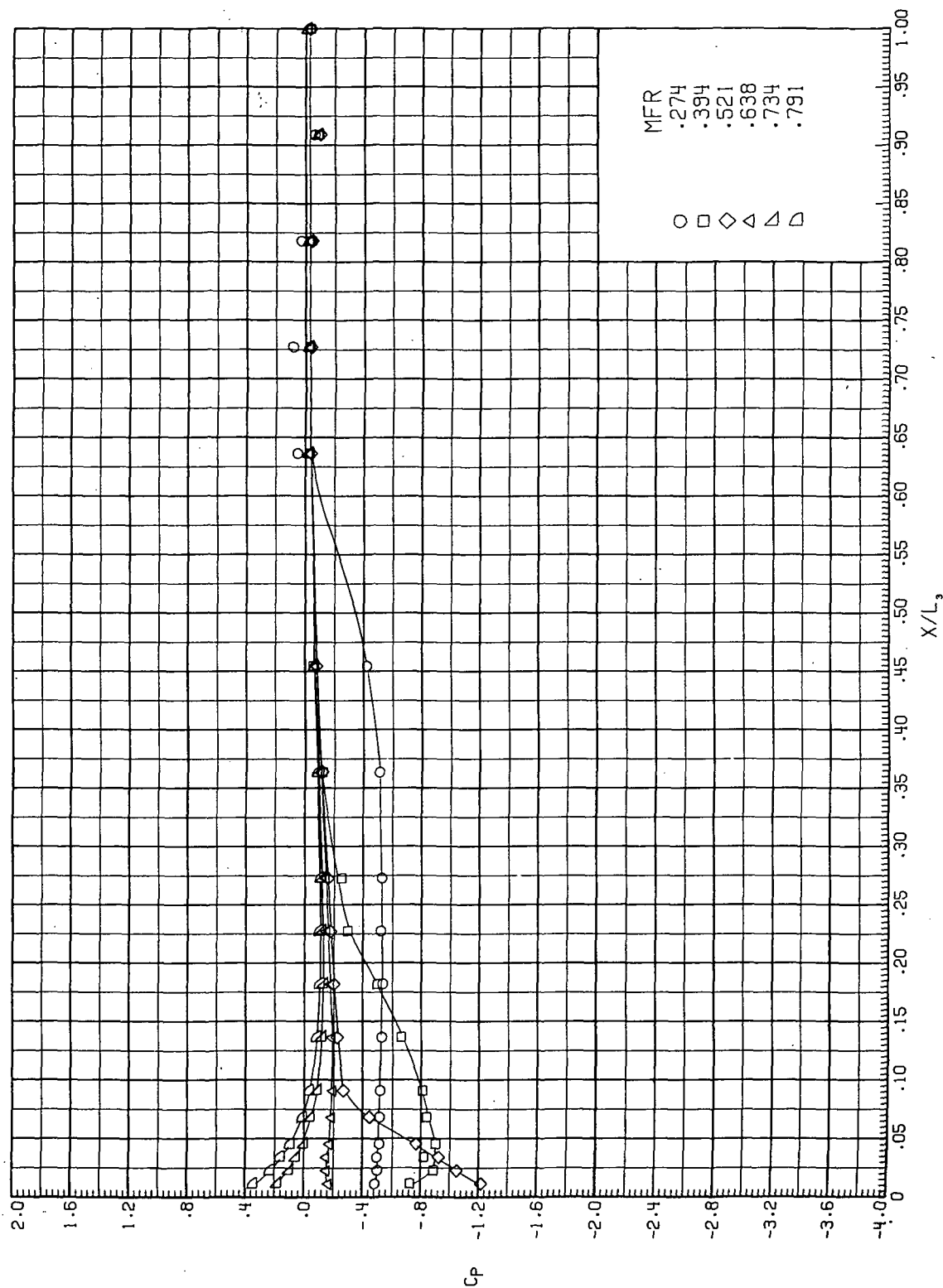
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



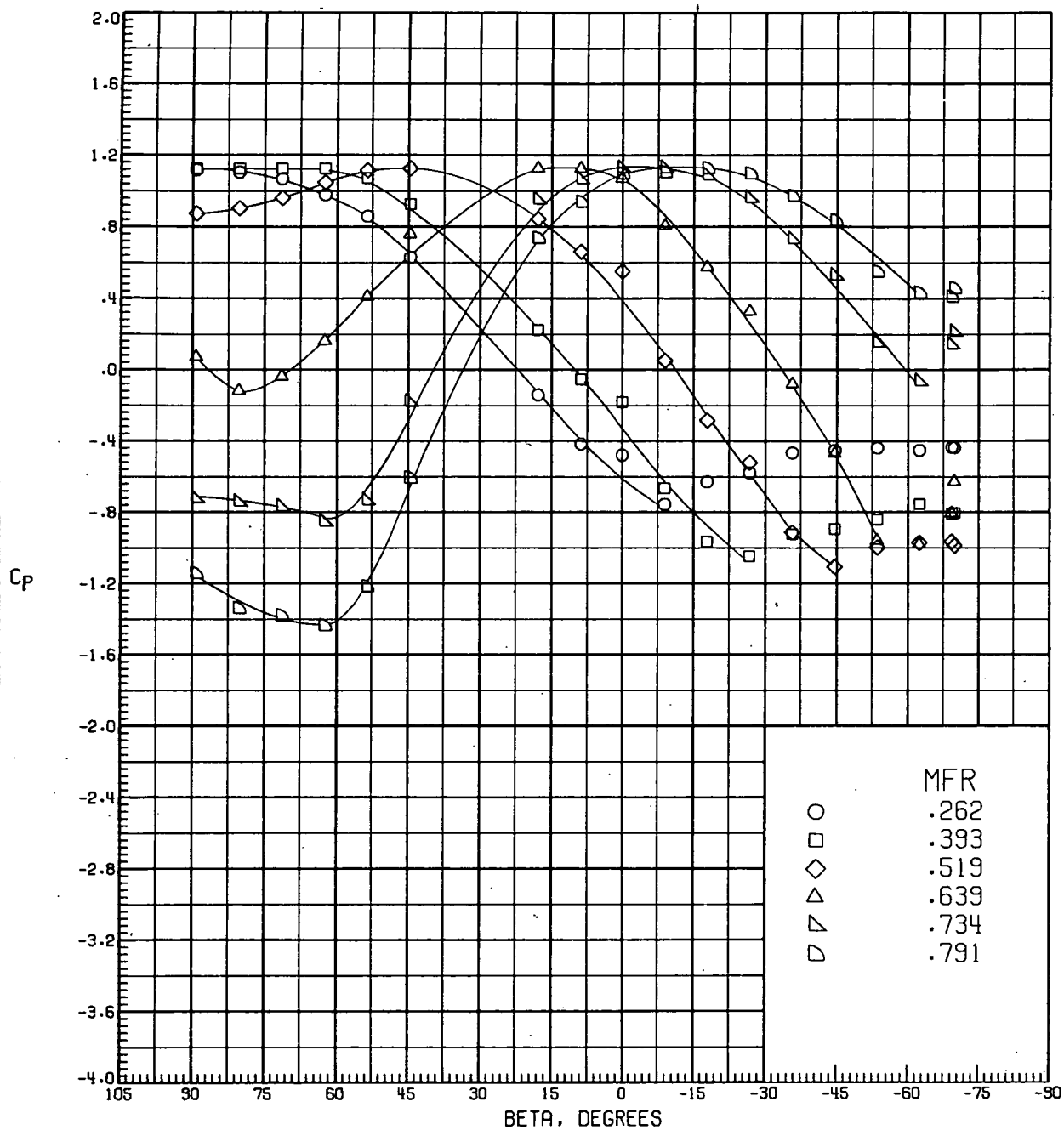
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



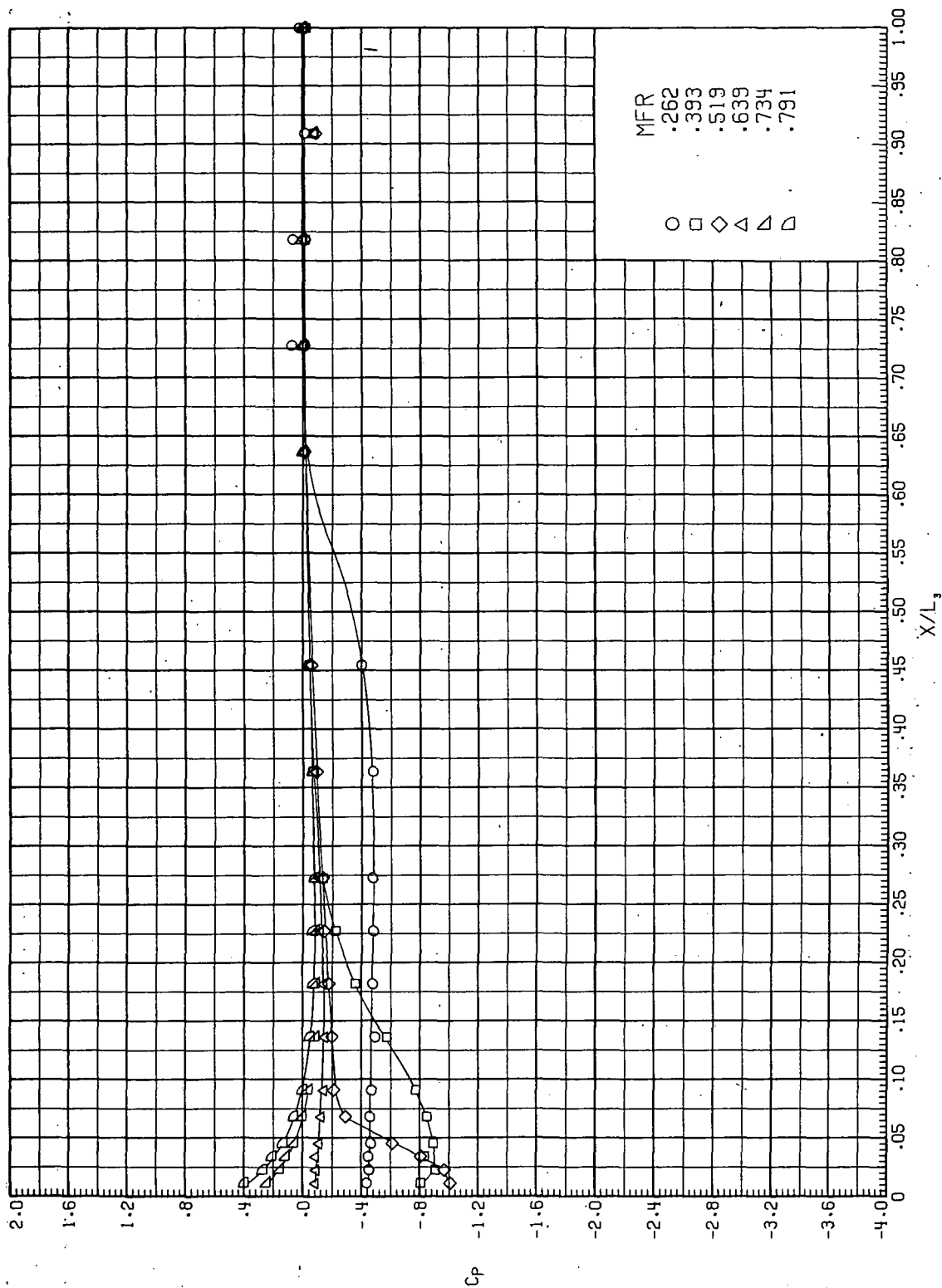
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36. - Continued.



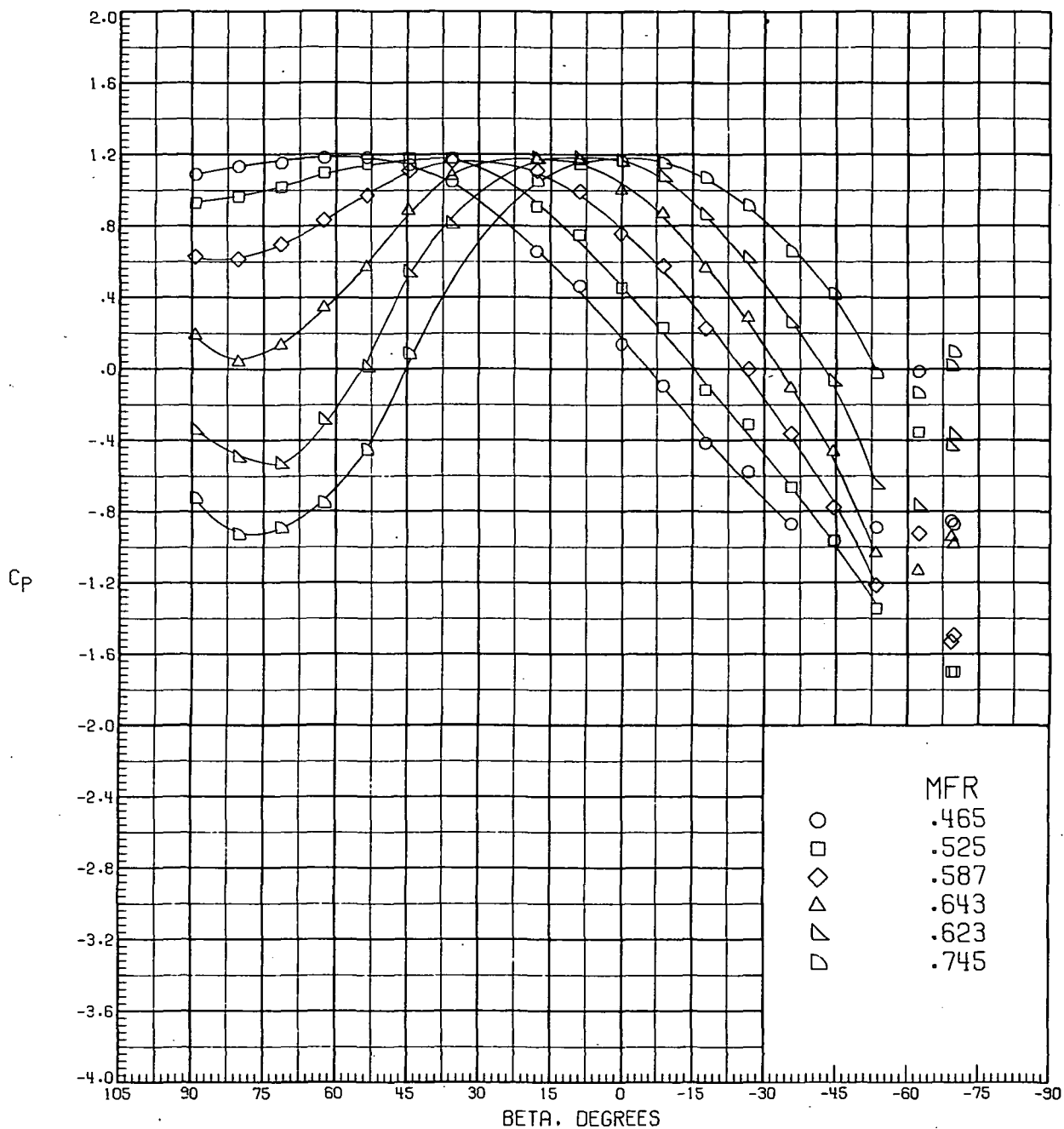
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



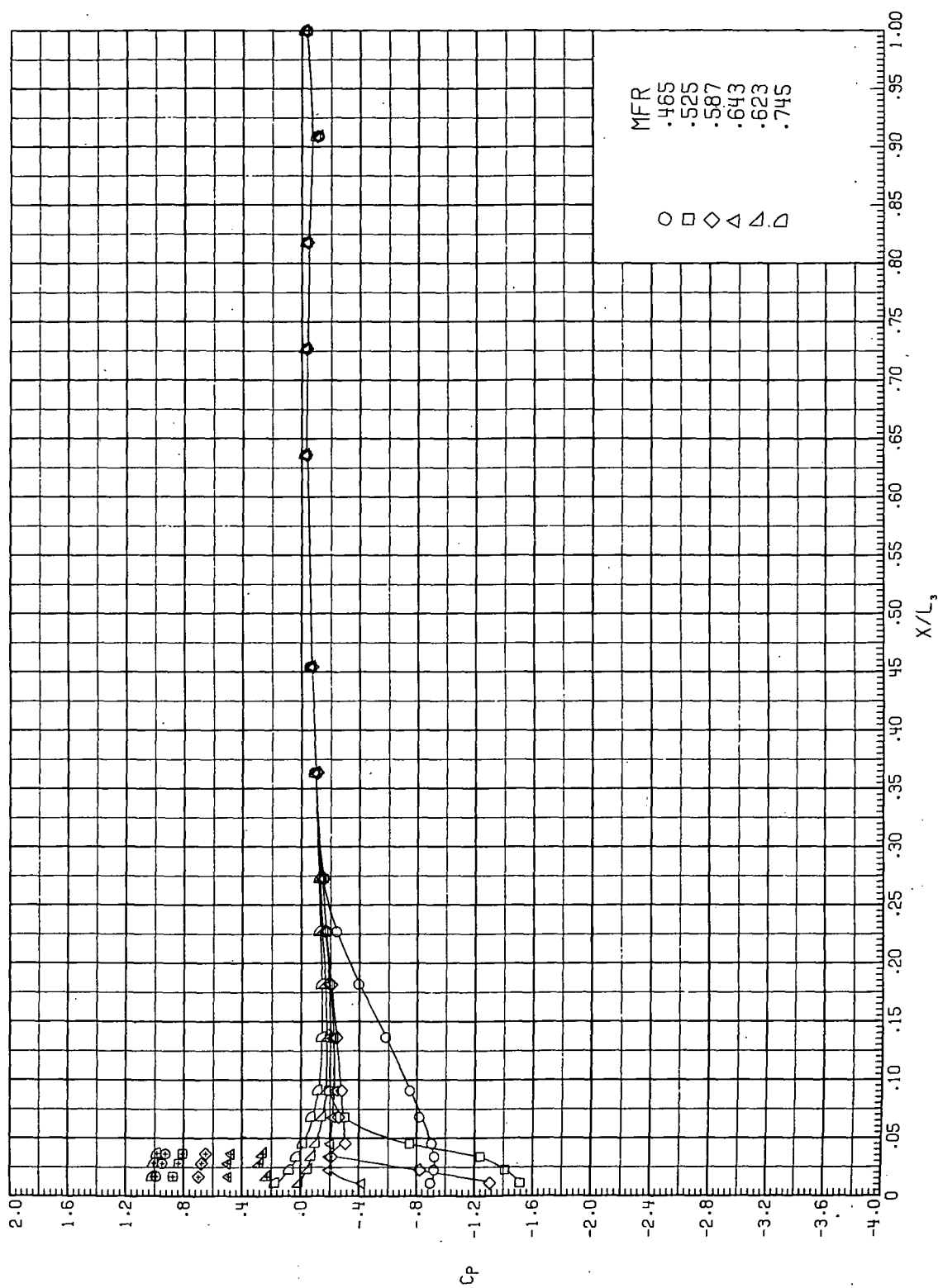
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



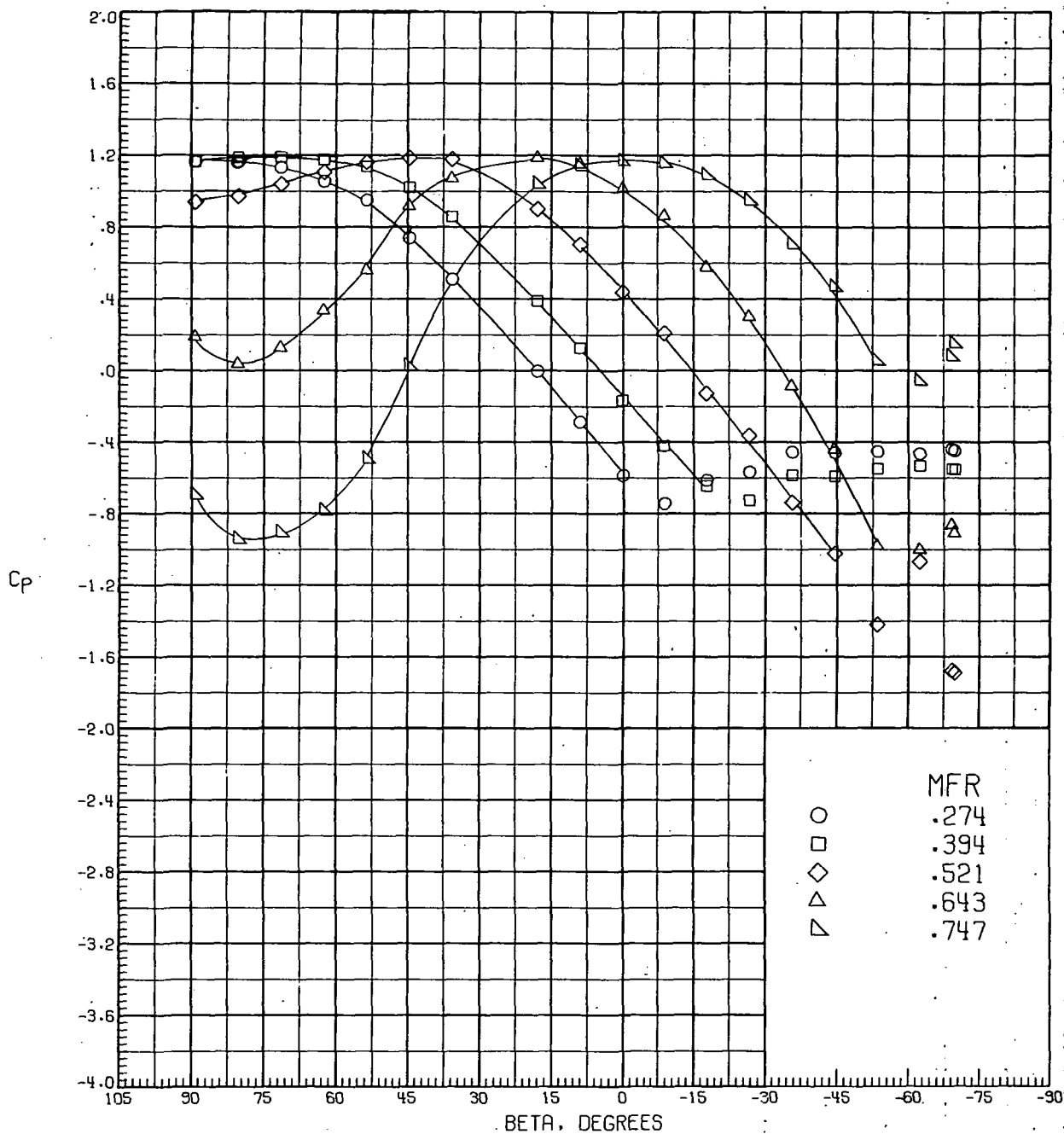
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



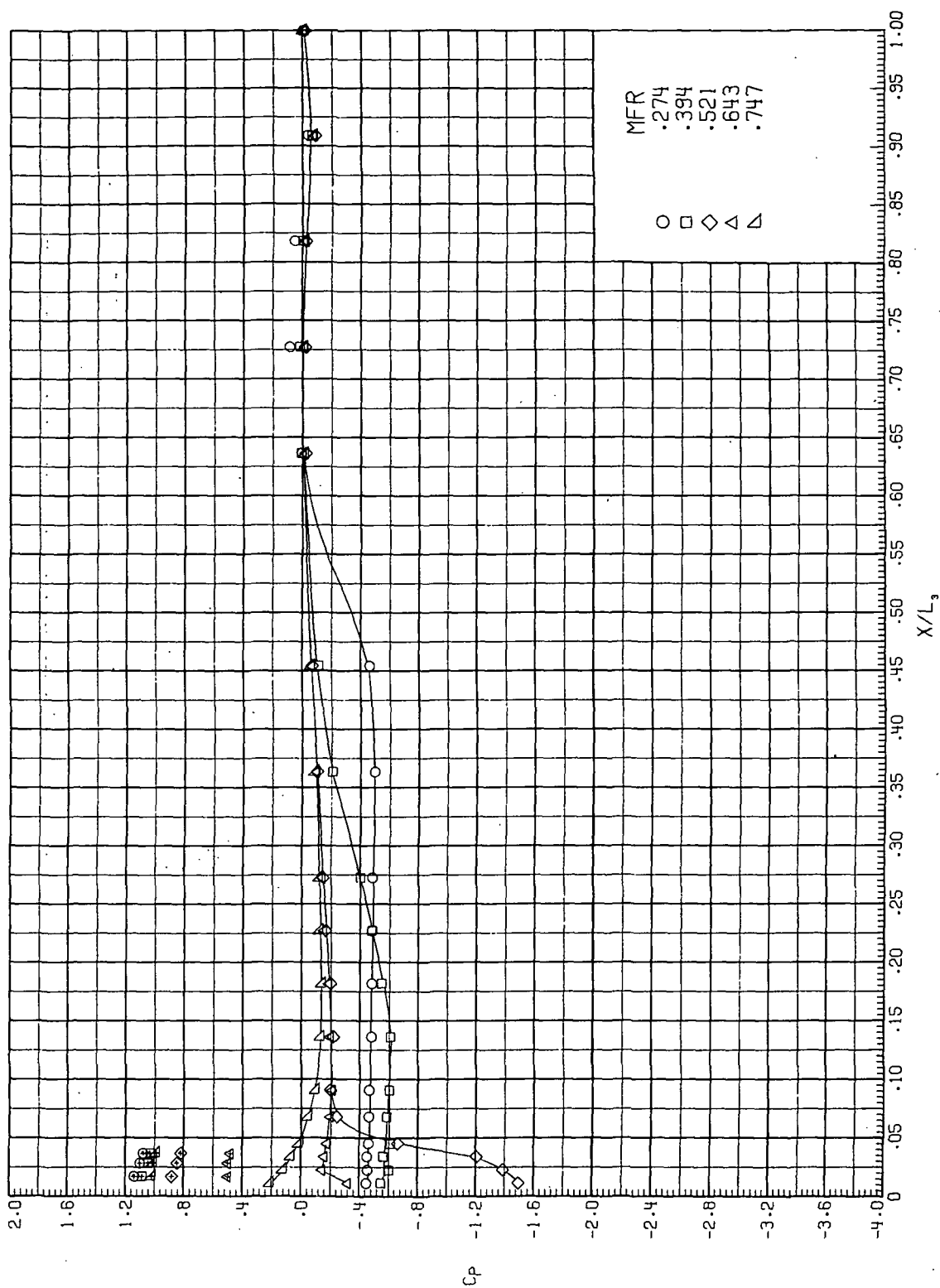
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



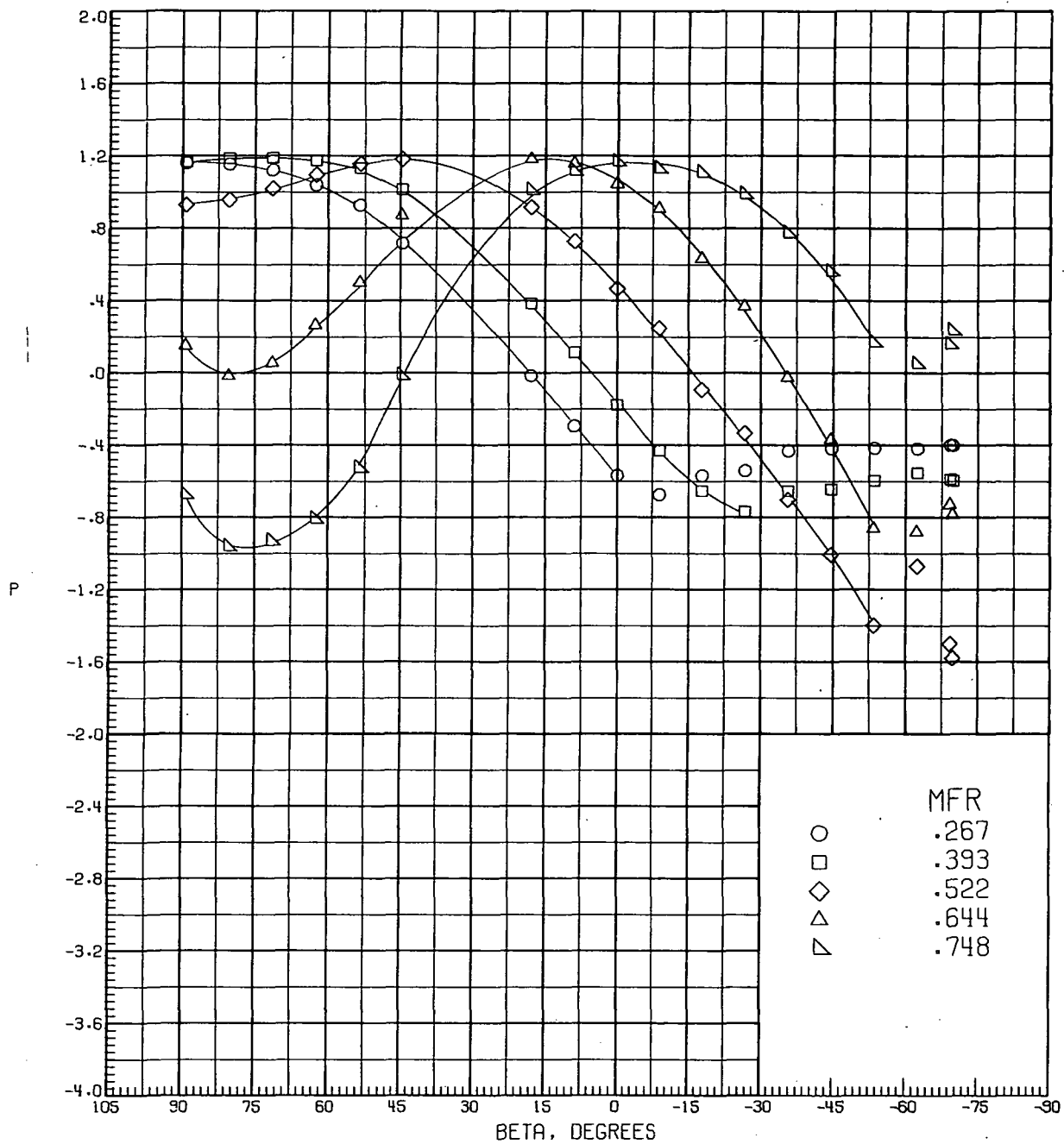
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



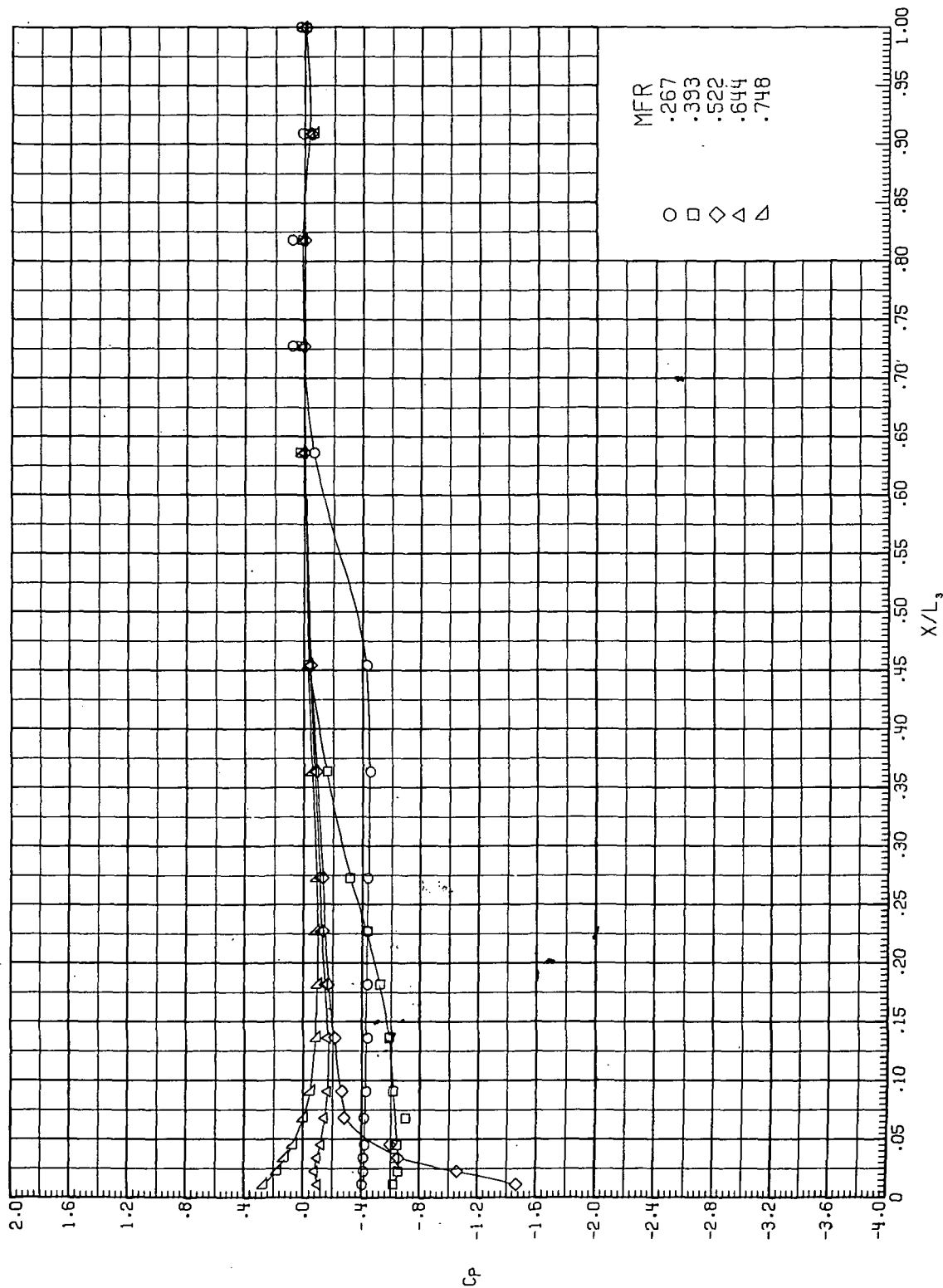
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36.- Continued.



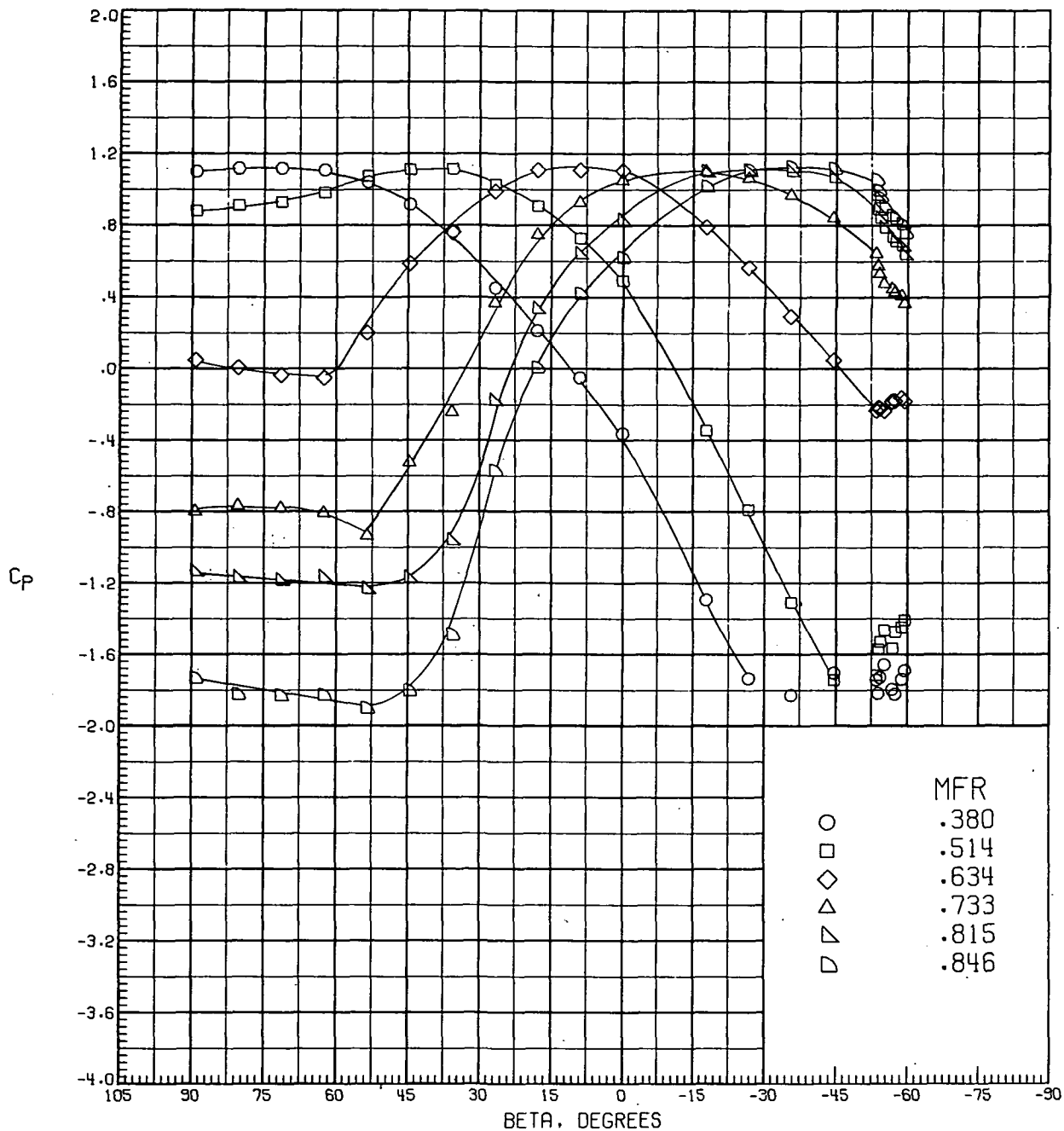
(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 36.- Continued.



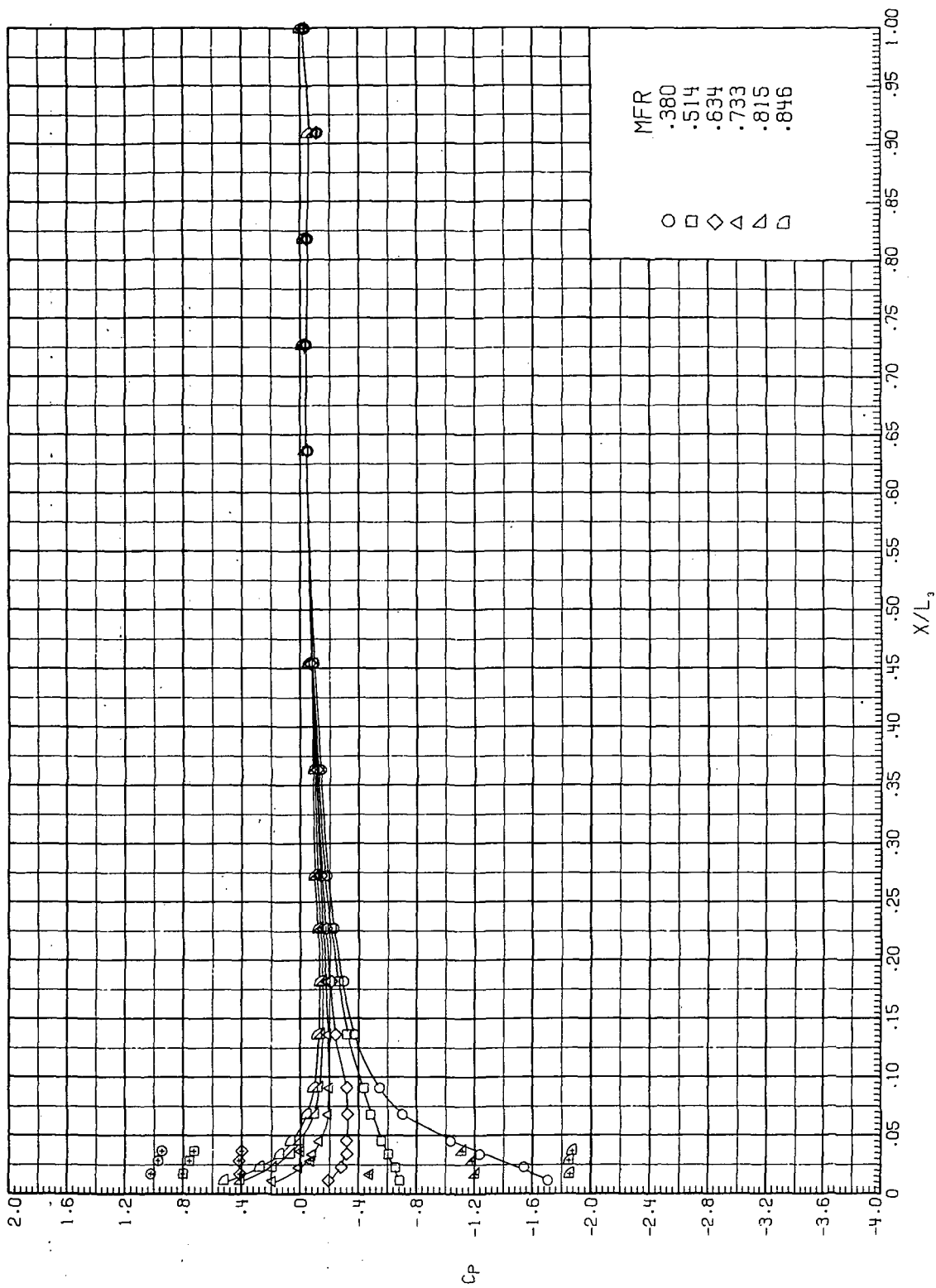
(1) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 36. - Concluded.



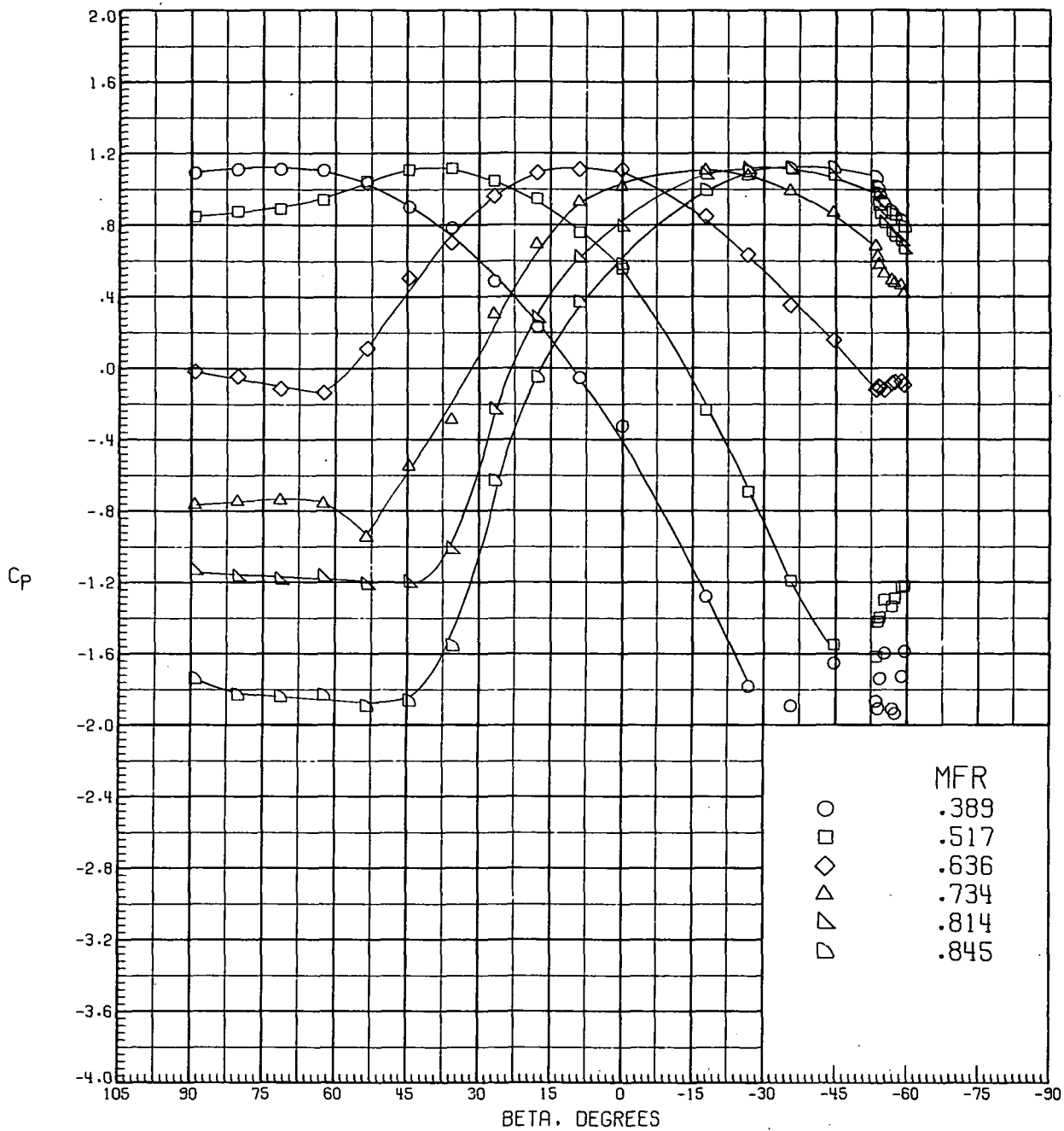
(a) $M = 0.6$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 37.- Pressure coefficients for cowl 35-2. $\delta_1 = \delta_2 = 5^\circ$.



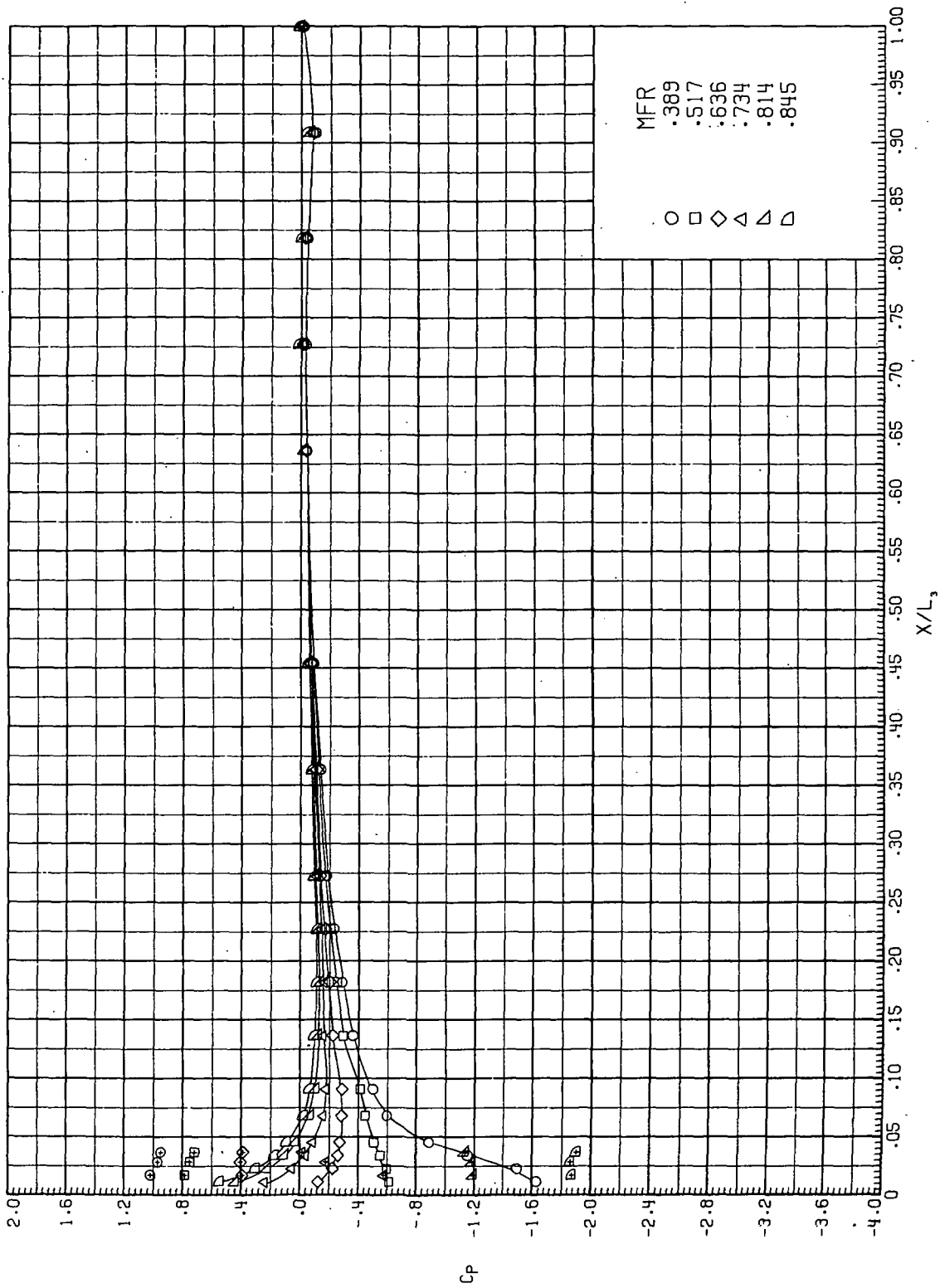
(a) $M = 0.6$; $\alpha = 0^\circ$; Cowl longitudinal pressure coefficients. Concluded.

Figure 37.- Continued.



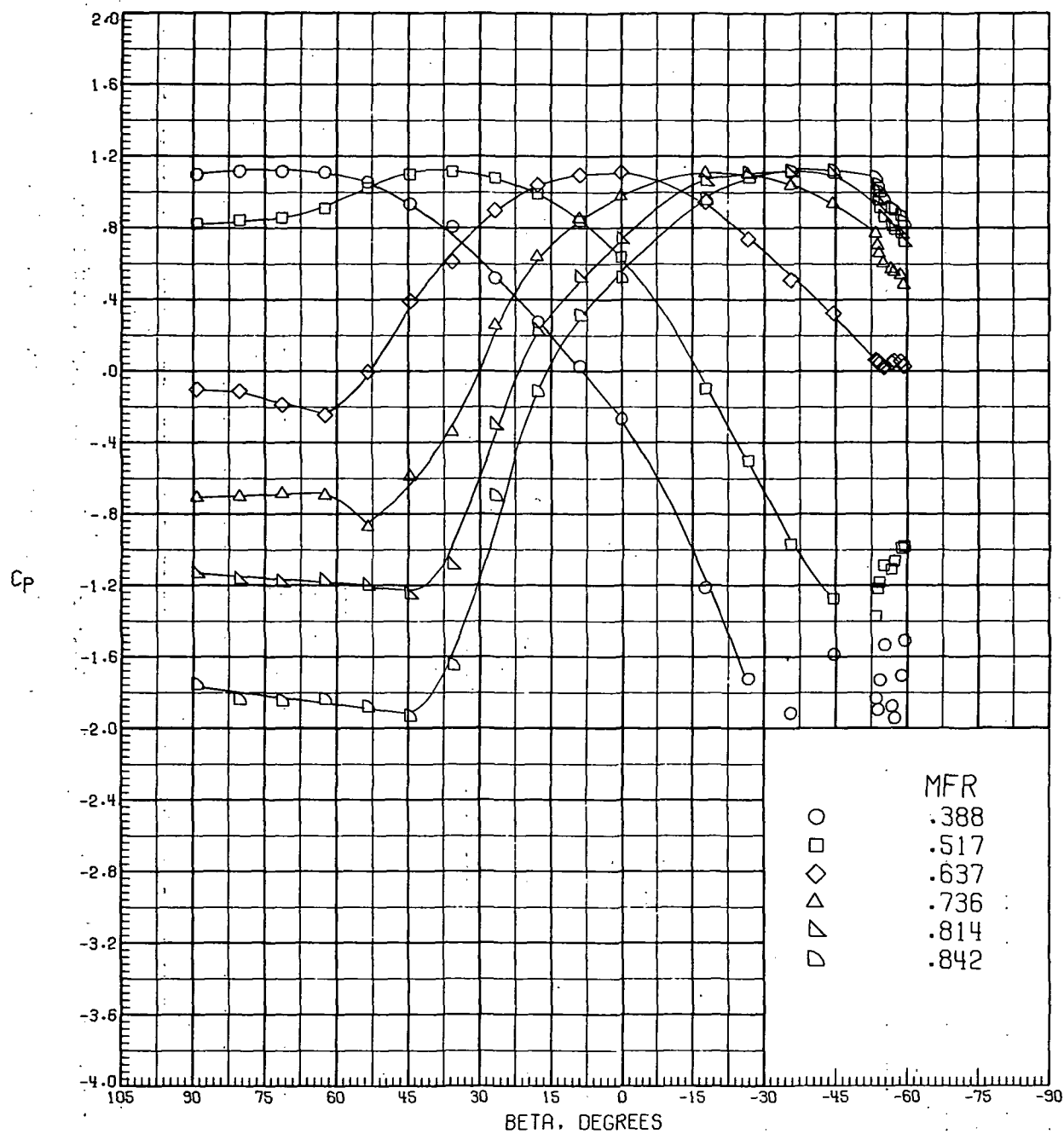
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



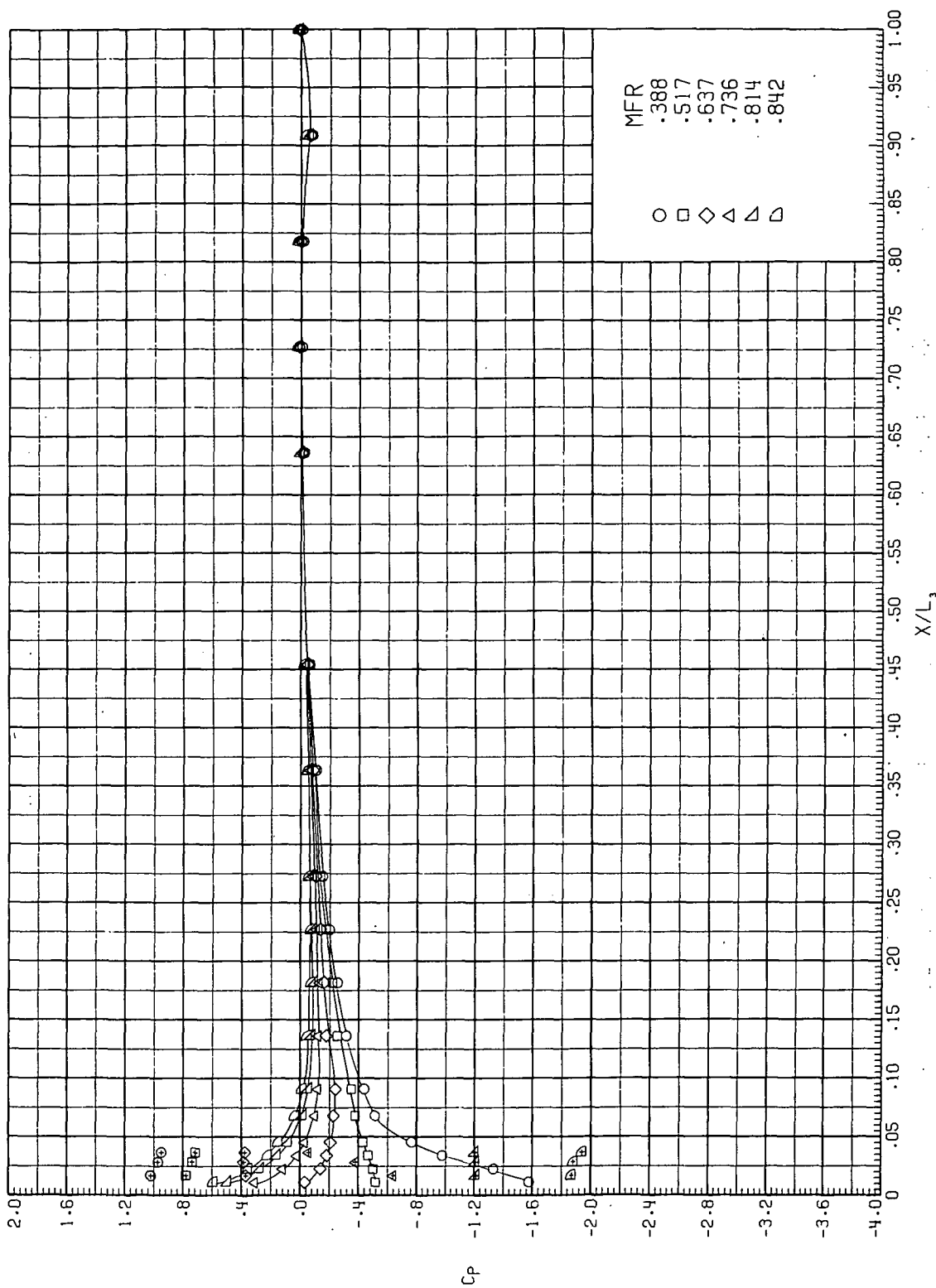
(b) $M = 0.6$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37.- Continued.



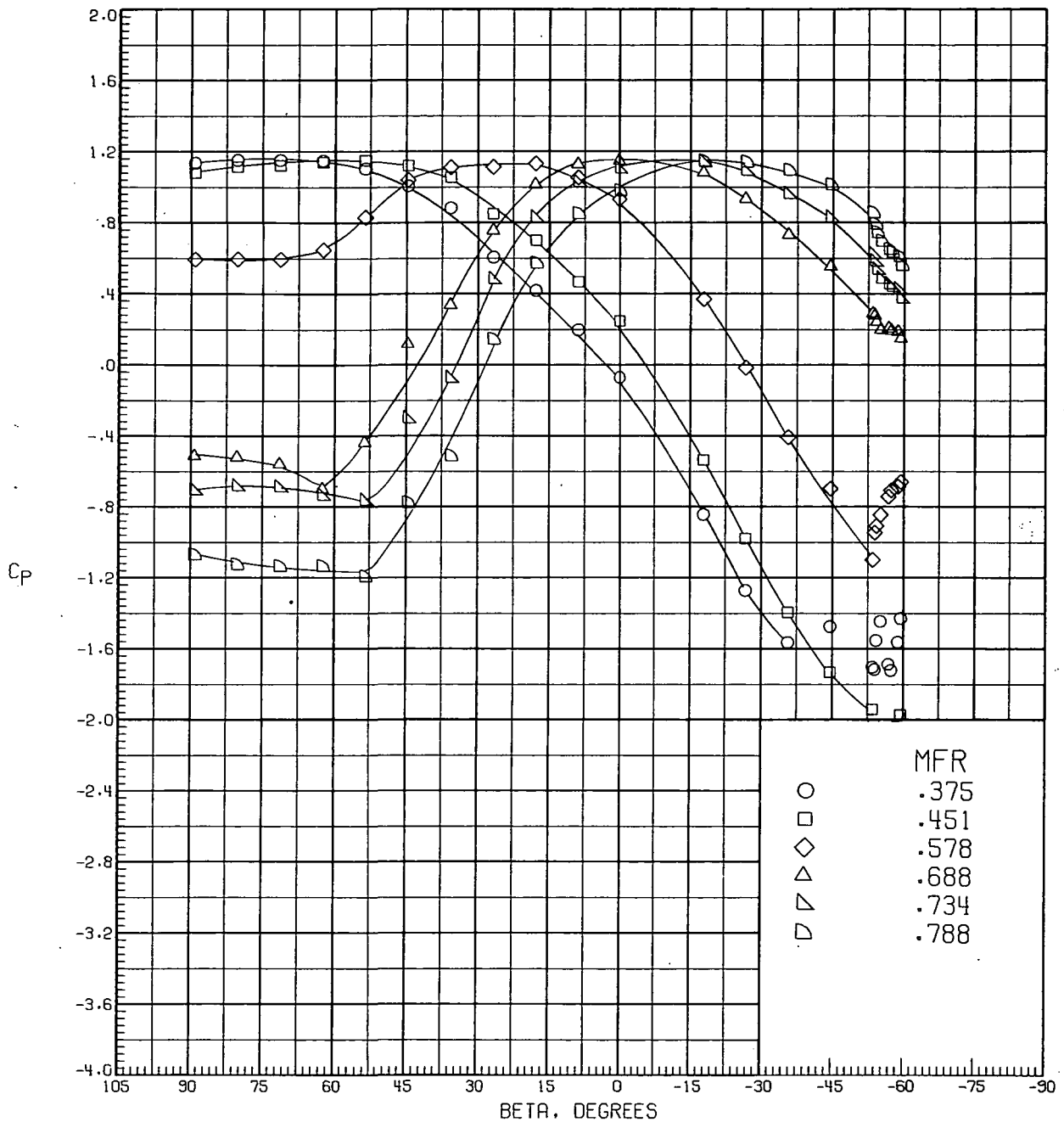
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



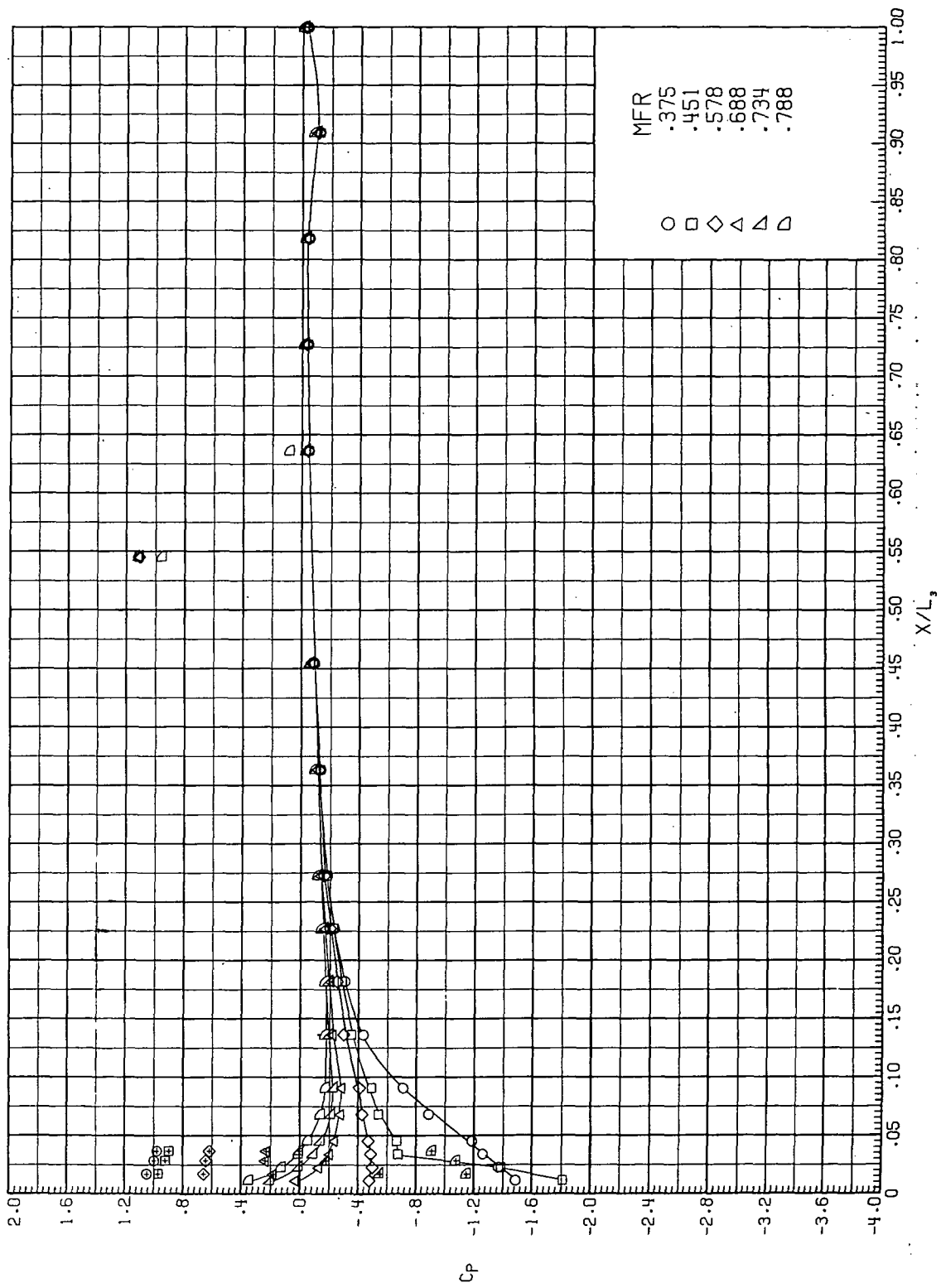
(c) $M = 0.6$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37.- Continued.



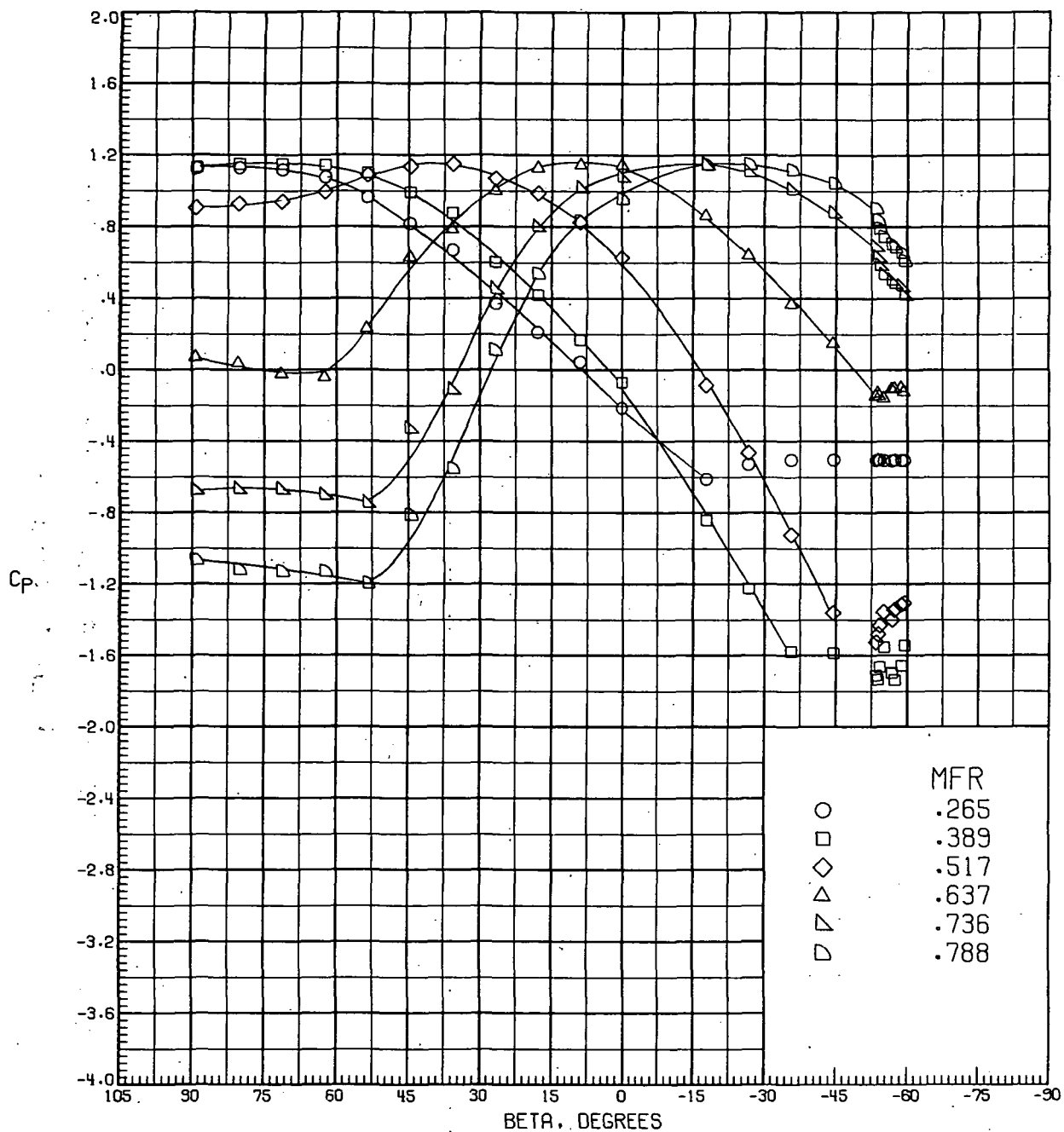
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



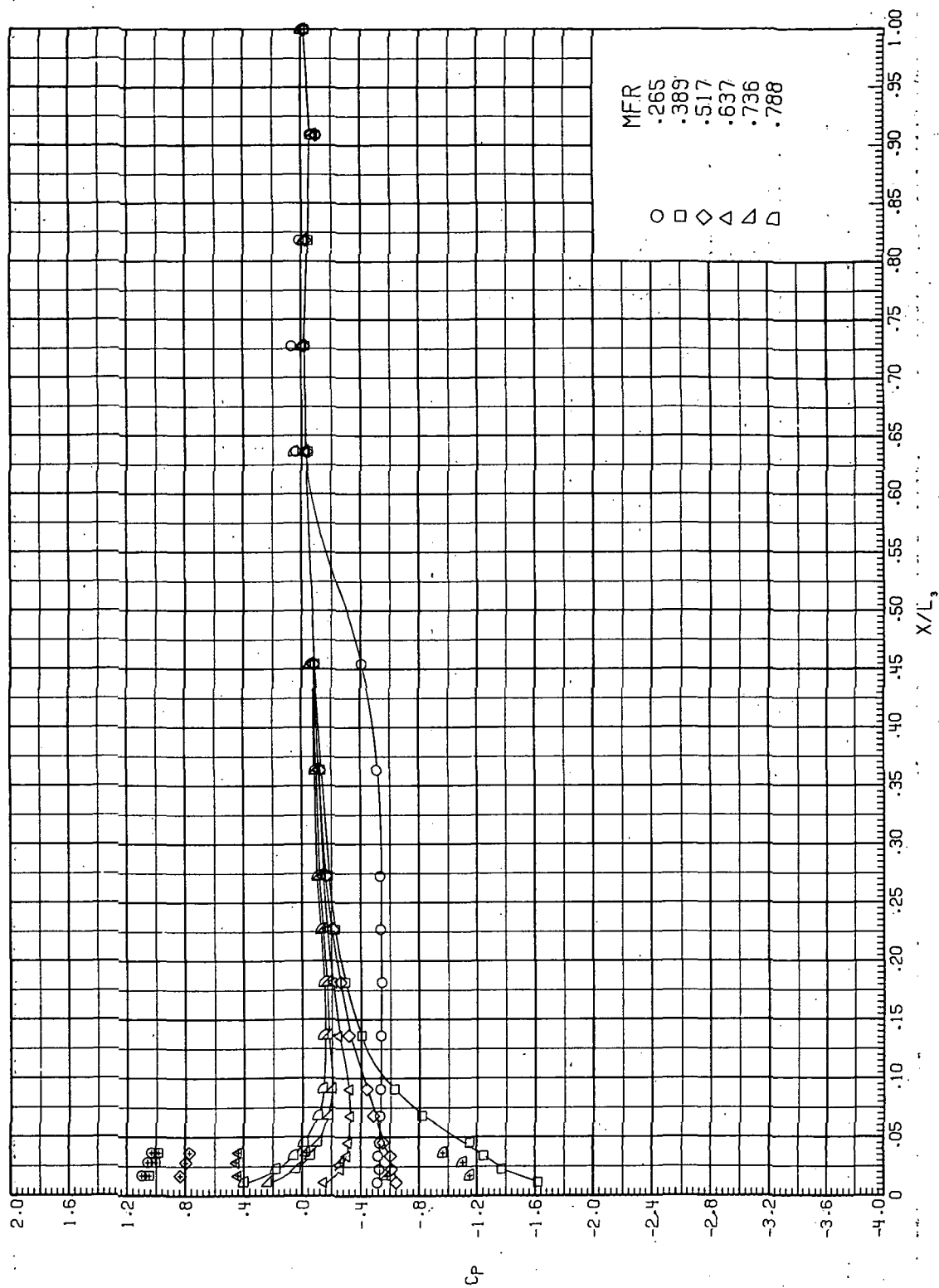
(d) $M = 0.7$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37.- Continued.



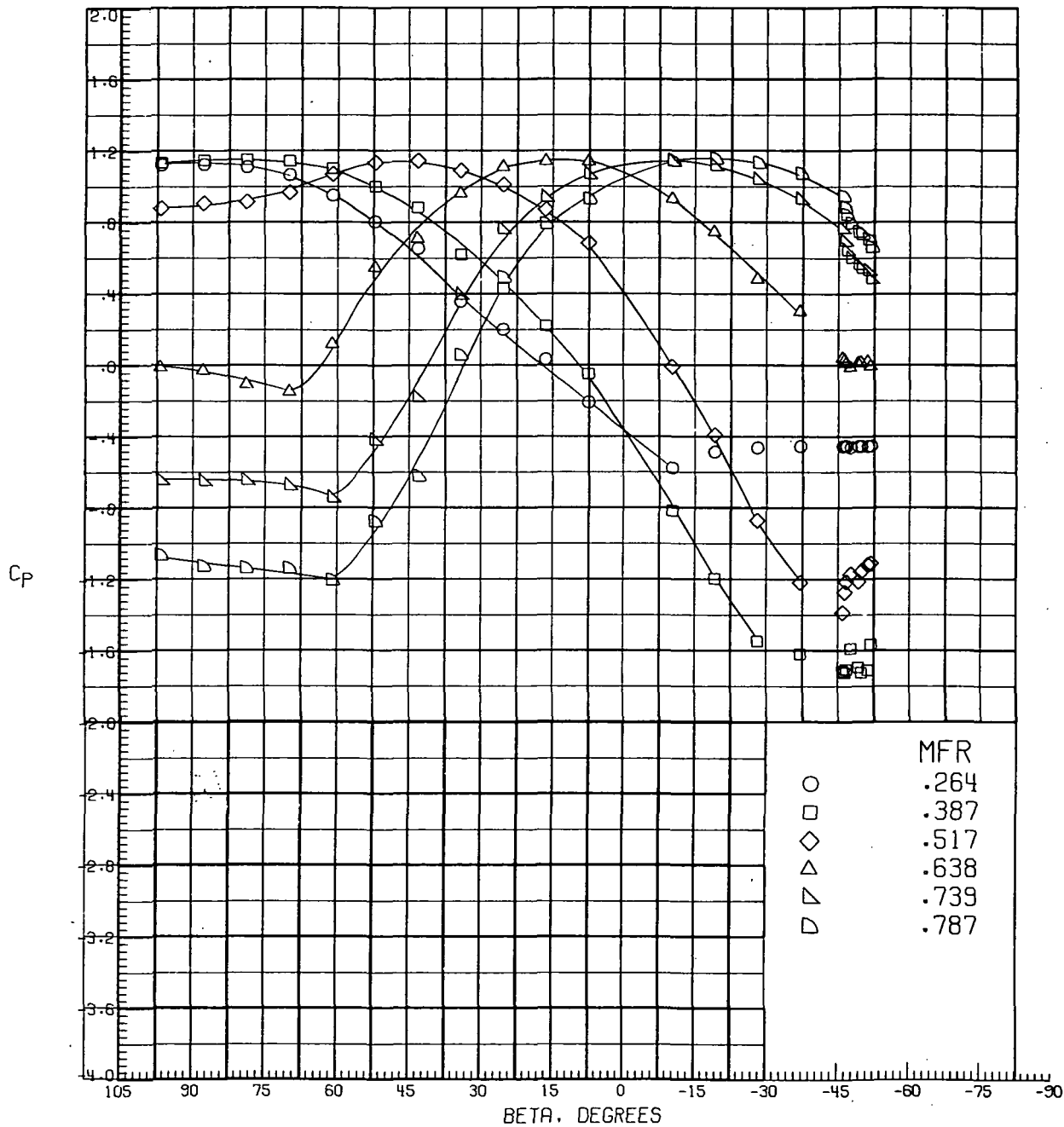
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



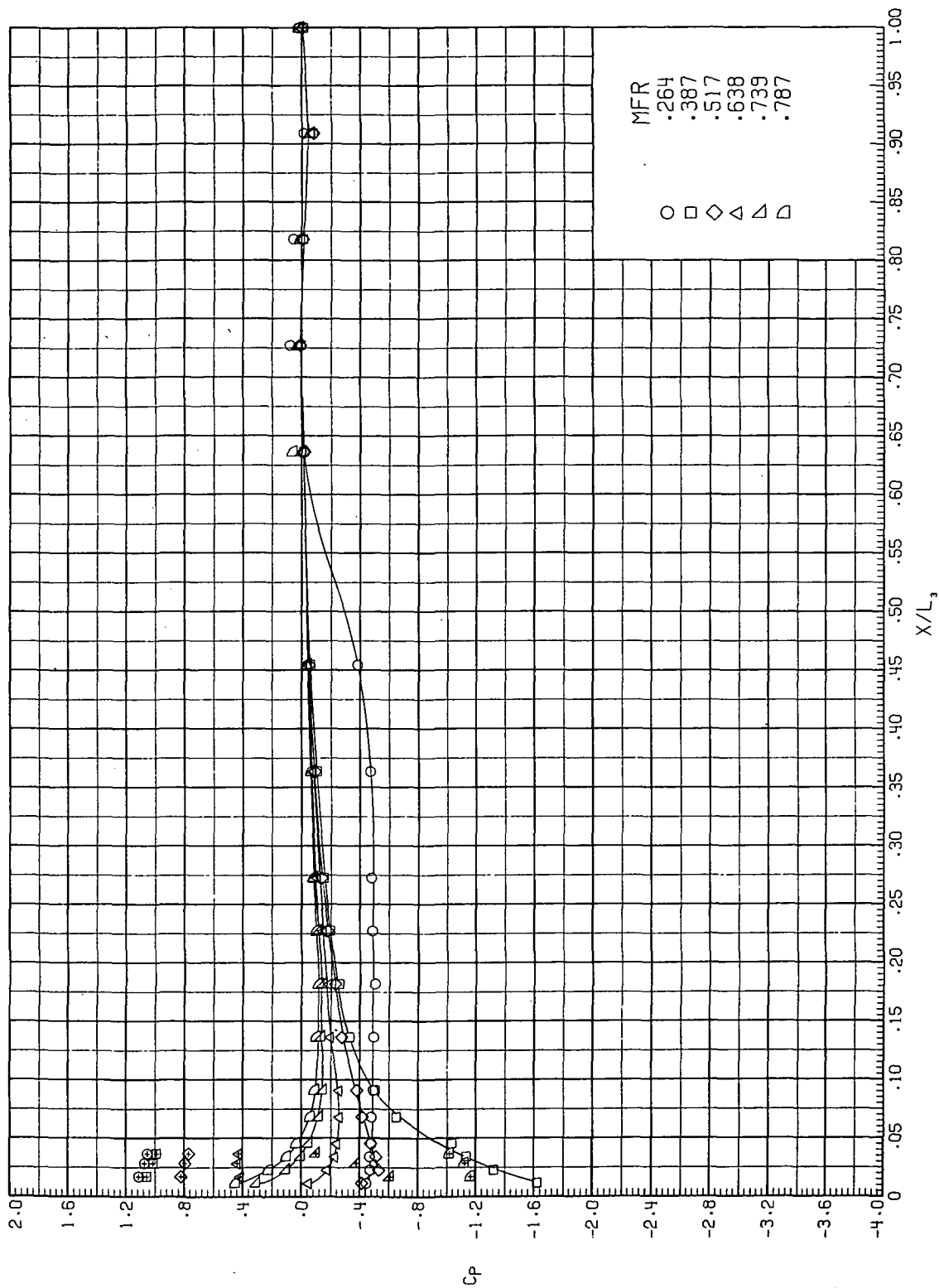
(e) $M = 0.7$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37. - Continued.



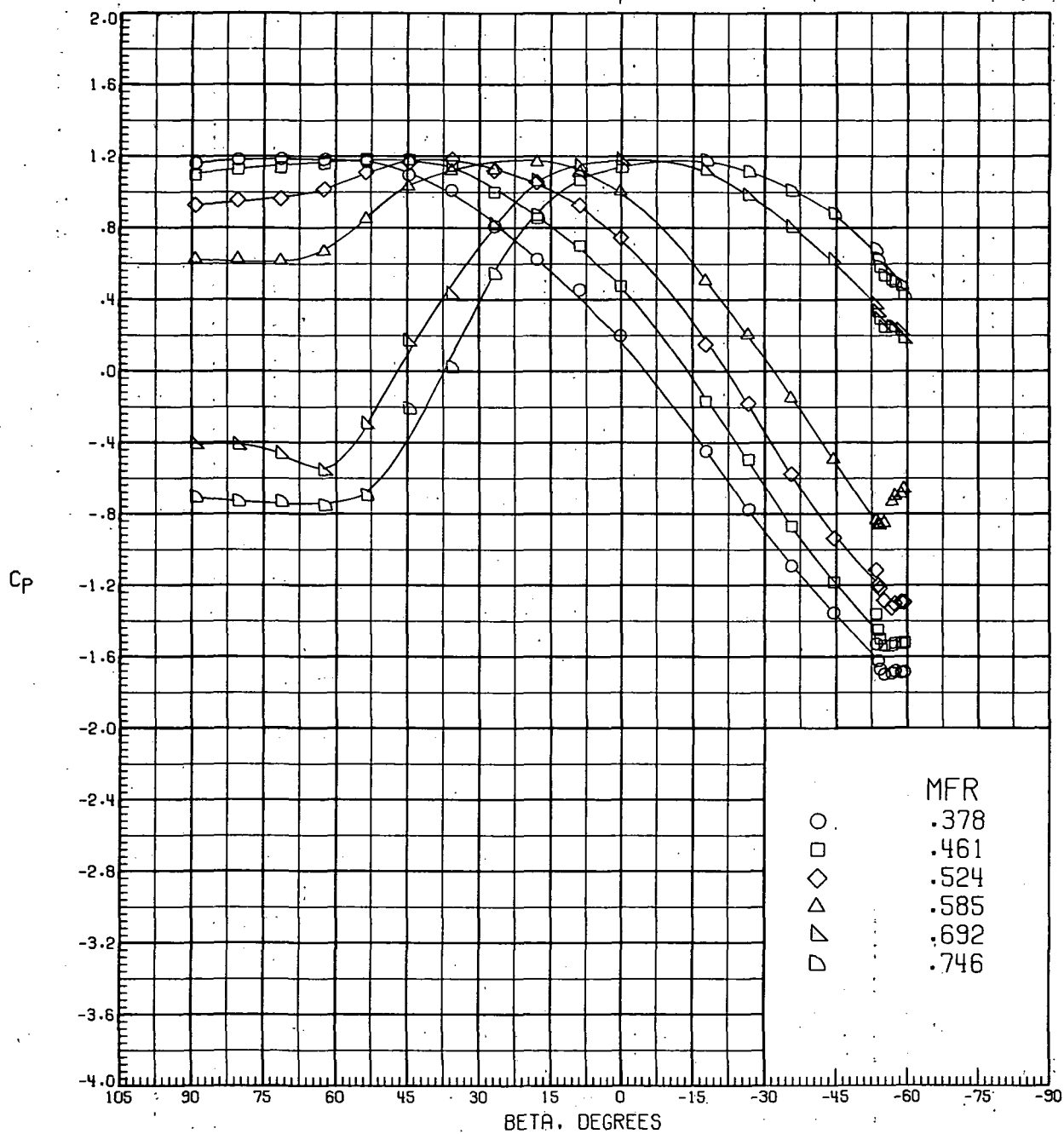
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



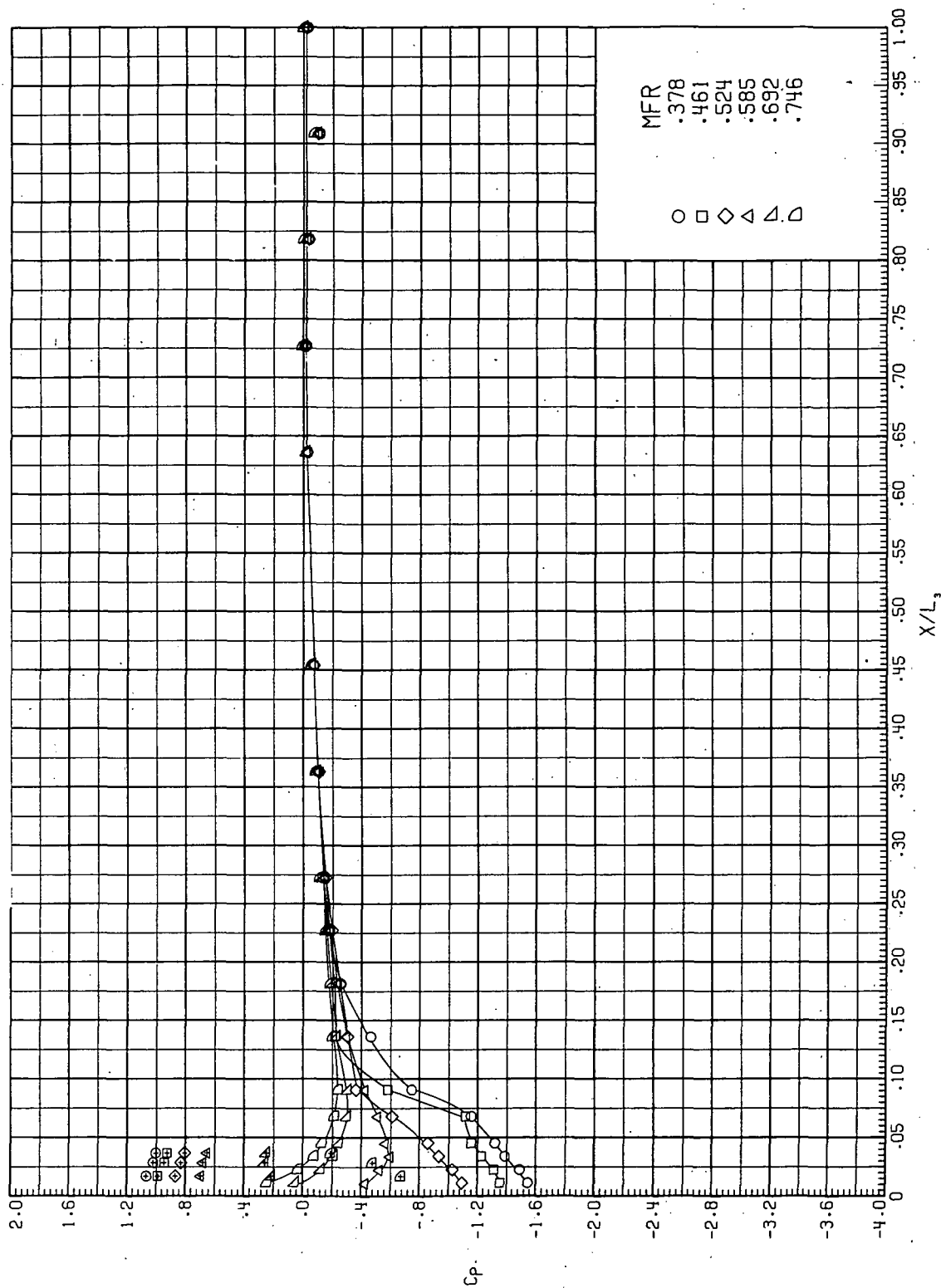
(f) $M = 0.7$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37. - Continued.



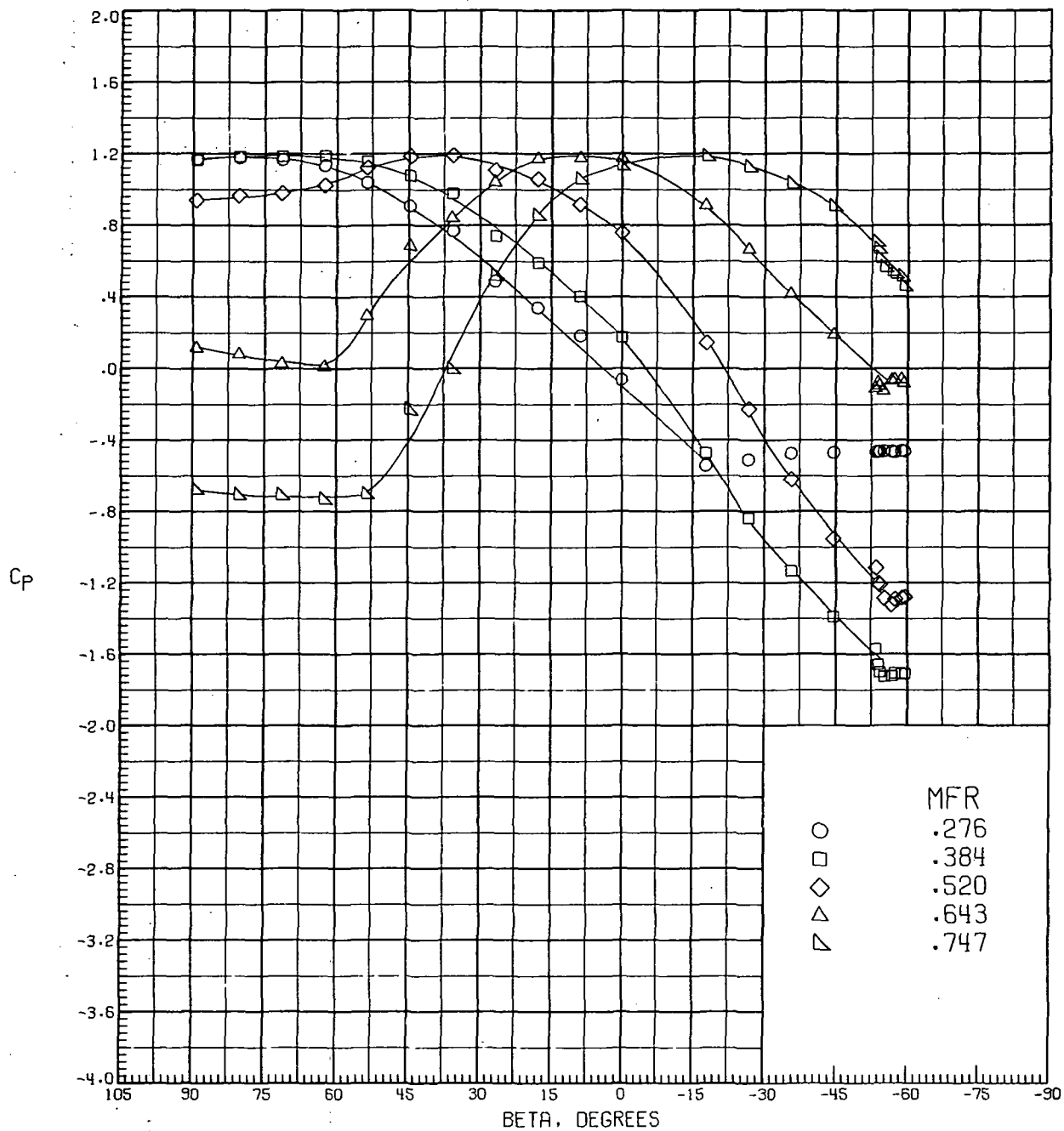
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl lip pressure coefficients.

Figure 37:- Continued.



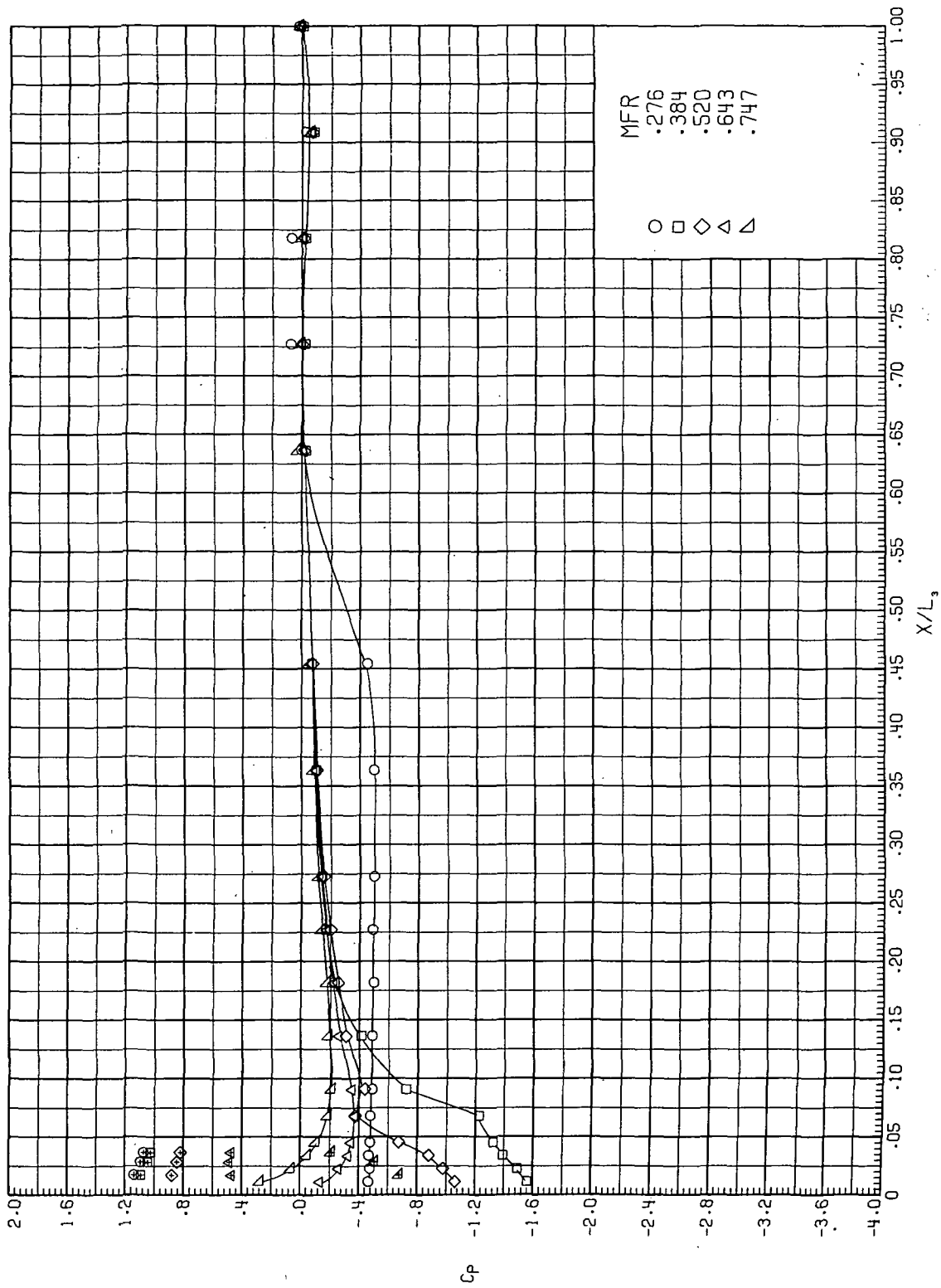
(g) $M = 0.8$; $\alpha = 0^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37.- Continued.



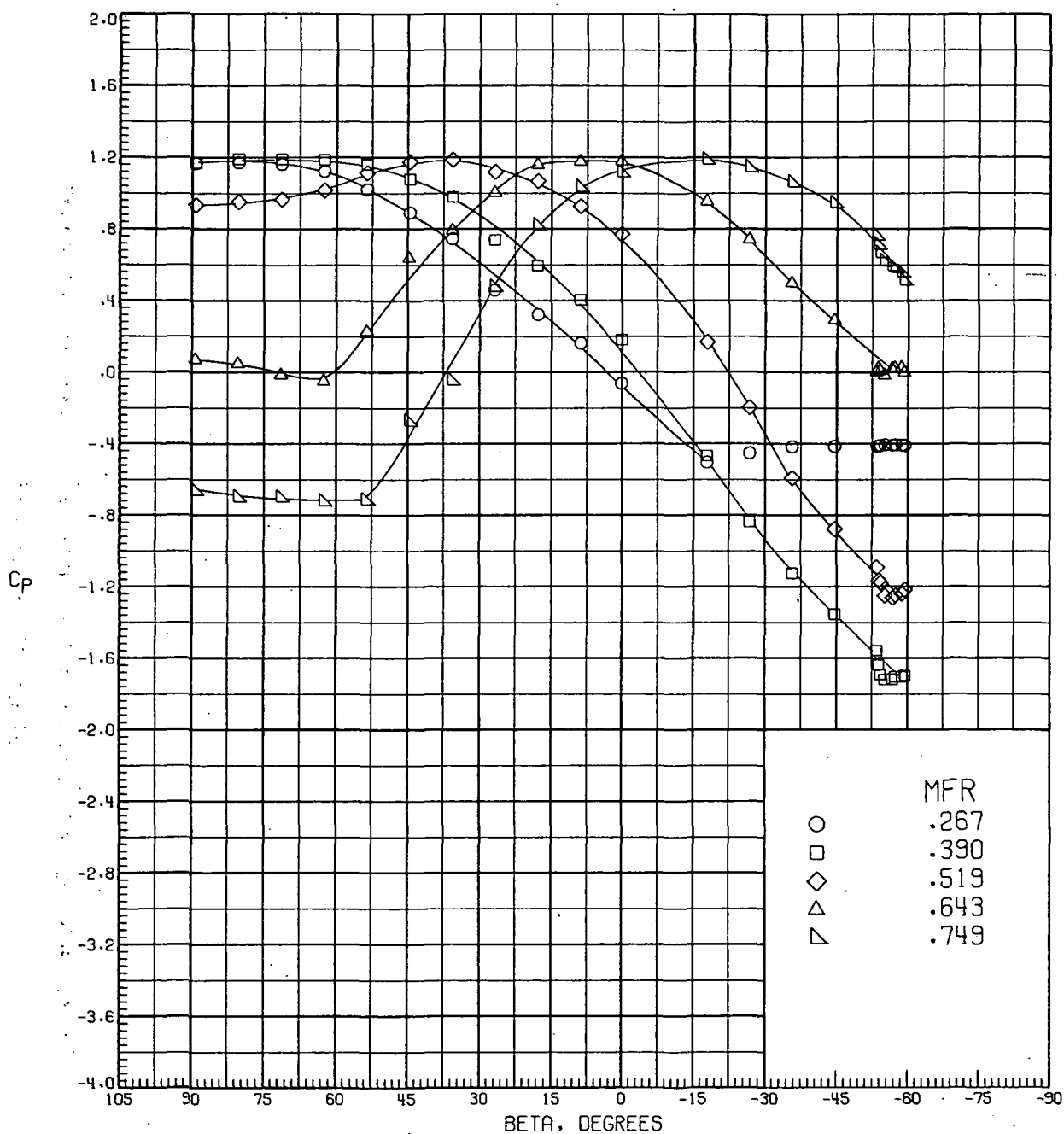
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



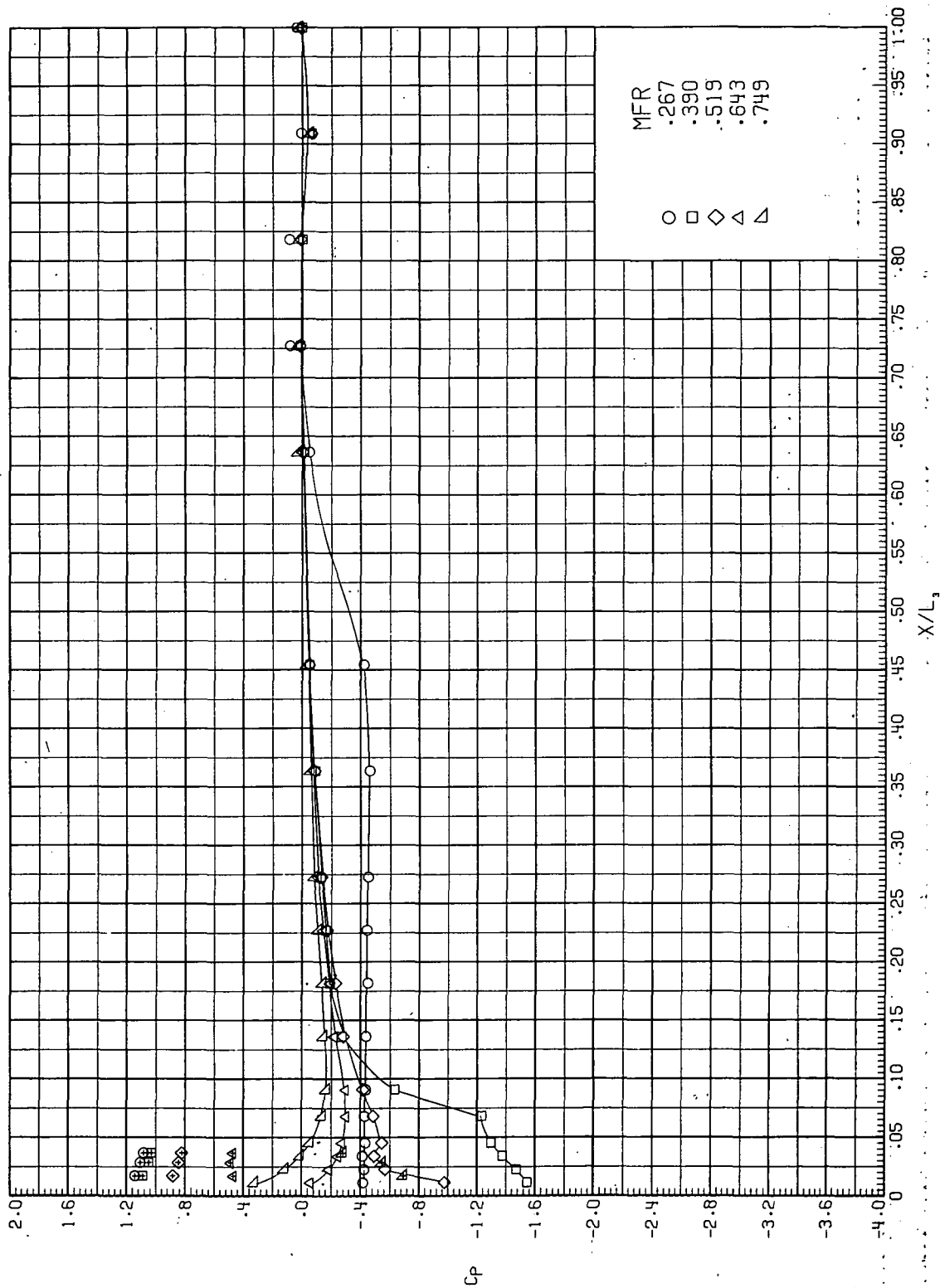
(h) $M = 0.8$; $\alpha = 4^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37. - Continued.



(i) $M = 0.8$; $\alpha = 8^\circ$; cowl lip pressure coefficients.

Figure 37.- Continued.



(1) $M = 0.8$; $\alpha = 8^\circ$; cowl longitudinal pressure coefficients. Concluded.

Figure 37. - Concluded.



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